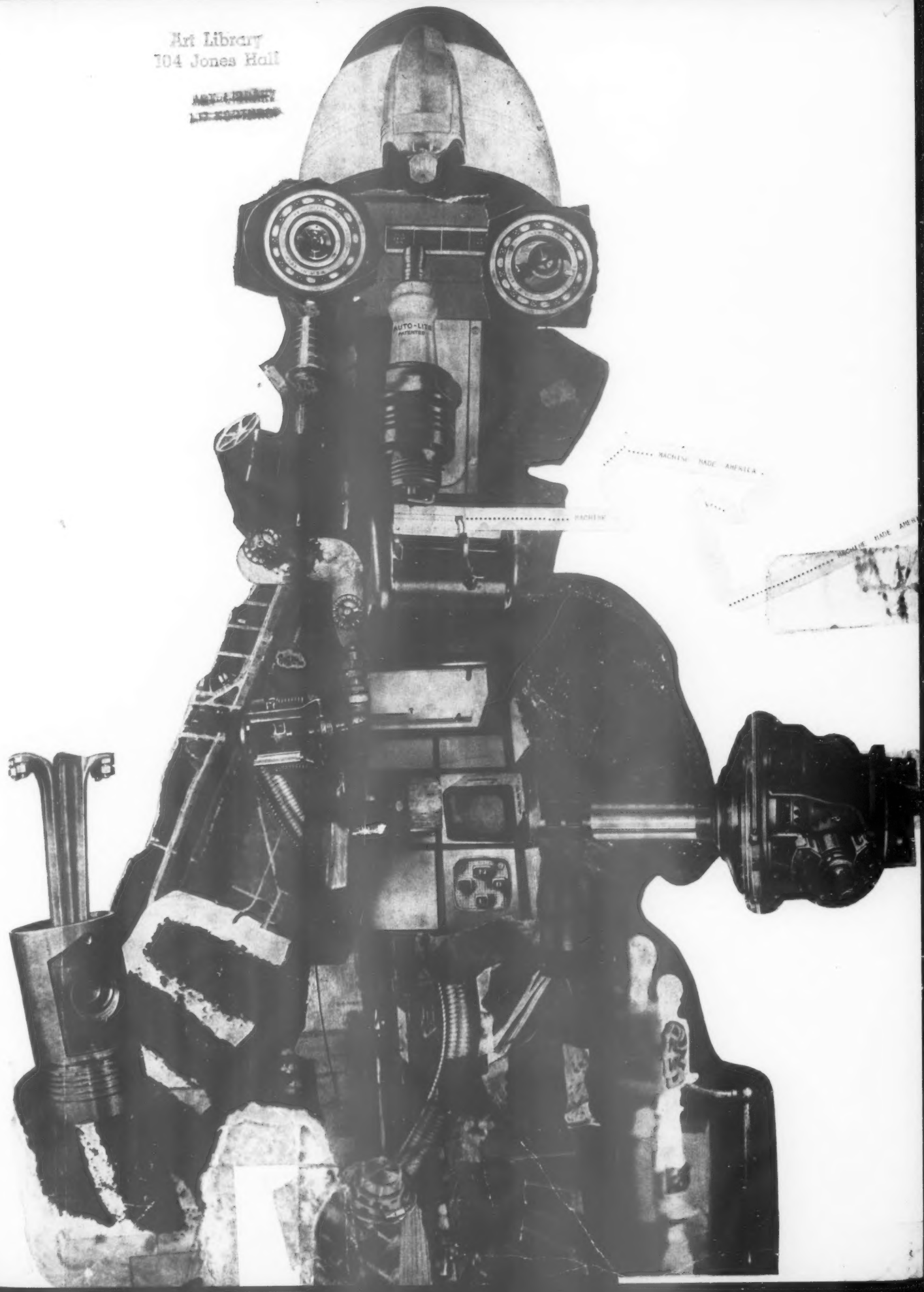


MARGINALIA

Marginalia, like this month's cover, and his own spare head (right, a collage sculpture of beer-packs and string) has been assembled from machine-made Americana by John McHale, Glasgow-born collagist, biographer of Buckminster Fuller (AR, July, 1956) and recent special student under Josef Albers at Yale.

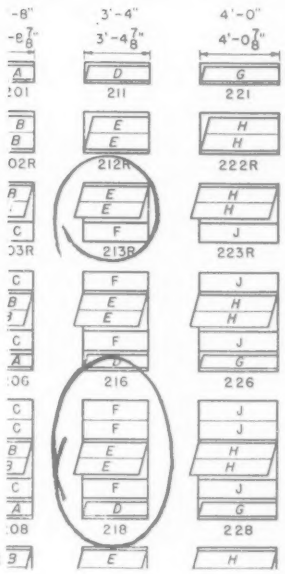
1

Eames: catalogue building

At this time distant, it seems remarkable that no sharp West Coast speculator has yet emulated the enterprise of Charles Eames, and produced a 'U-bild-it' kit for a full sized house, or perhaps, at lesser remove, something on the lines of the 'customizing' items, advertised in U.S. car magazines, for giving that personal touch to the family auto. But, no doubt, even given such acumen, the Eames 'Catalogue' house would still stand as an unique and completely individual essay in meccano aesthetics. The view of the house shown here 1, is of the living room end, where the bedrooms occupy the second storey; the overprinted numbers on the window elements are the types, chosen by the architect, from the catalogue of the Truscon Steel Co. 3, gives a detail of the actual page section of the company's 'Architectural Projected Windows' with Eames' own notations.

2

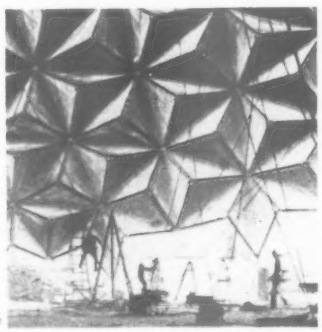
In between extracting components from catalogues, and seeing their own designs get into catalogues, Charles and Ray Eames have contributed a chair to one generation, produced toys to confound the next, and turned out a series of original essays in film. Contrary to rumour, the sequel to 'A Communications Primer,' one of the latter, is not, Eames says, 'to be called "Son of Communications" or "Communications Rides Again"—but "Theory of Feedback".' Although the relationship of these film projects to architectural and other designing may seem tenuous, Eames does emphasize its relevance. His point becomes clearer when one considers the way in which I.B.M. have used Eames as a consultant—not on the design of actual products—but charged with carrying the designer's attitude into other management areas. His latest design is in the same territory of Communications—a loudspeaker enclosure 2, the 'Quadreflex,' designed in collaboration with Stephens Tru-sonic engineering staff.



3

Fuller: global encirclement

Though more amenable to catalogue treatment, and mass production, than the traditional building, the geodesic dome is still, generally, on a one-off basis, individually tailored to specific requirements. But the recent licensing, by Fuller, of commercial fabricators to produce domes, may change the situation. The biggest dome yet 4,—all aluminium, 144 ft. diameter and 57 ft. high—has been turned out by Kaiser Aluminium Co. This was erected in 20 hours by 38 men for a resort auditorium in Honolulu to seat 1,800 people. With locations such as this, Fuller domes grow more geographically widespread; radomes in the Arctic, a concert hall in the South Seas and the recent one in Kabul, Afghanistan. This latter, the Kabul Dome, 100 ft. diameter, of aluminium tube and nylon skin, was designed for the U.S. pavilion in the International Trade Fair held there, and housed, among other items, an 80-ft. Cinemascope screen. From initial inquiry by the client, through designing, fabrication, transport, to final erecting on the site, took around 8 weeks. After Kabul, it is touring the Far East, and will eventually come to Europe this year.



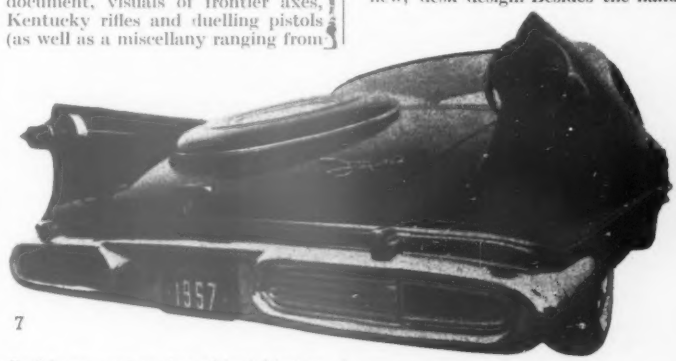
4

'Good to look at, pleasant to hold'

From General Motors pop. book on styling, the above quote refers to an example of hand sculpture from Pratt Institute 5, which shares page honours with a vacuum-type coffee machine, fender detail from a Pontiac dream car—and an egg. Earlier in the same document, visuals of frontier axes, Kentucky rifles and duelling pistols (as well as a miscellany ranging from Gothic armour to fine china) hint at a lineage for auto styling via the American tool-making tradition. Superficial visual parallels might be drawn when one compares a particularly over-bred match rifle 6, the Hammerli MJ 452, with 7, the rear end of the 'Flight Sweep Year' Chrysler '57, but the real case for the curvy plastic buildup is implicit in current consumer preference, and thence more directly original to car styling itself, as source, than the ergonomic hand tool. (These issues were fully discussed in AR April 1955, *Machine Aesthetic*, Reyner Banham.) Essentially the point, nowadays, about the auto is, that you don't handle it, but, see 9, Plymouth Pushbutton Powerflite ad., get in and push the button. With G.M. Tech. Center interior detailing, the car industry, as consumer, shows the same capacity, as above, for the all-in, both-and, stance in styling. Prestige type, permanent rectangular aesthetics, with a Miesian flavour, are duly given their operational sphere, but when it comes to a desk 8, for king-pin of the styling section, Harley Earl, his staff turn out a patiently hand-crafted cherrywood monument—with a difference! Its sleek curvaceous bulk is of the same sandwich construction as, now obsolete, wood moulds used in forming auto bodies. A neat way of including tradition in and incidentally producing a particularly impressive, and 'new,' desk design. Besides the hand and eye pleasure in its lush contours, the desk provides much manipulative therapy for the active executive by way of pushbutton panels for lighting, temperature and TV control, as well as a built-in waste basket.

5

6



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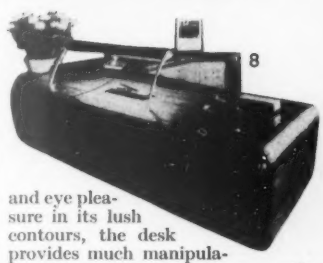

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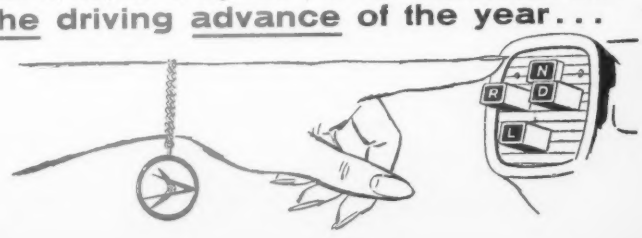


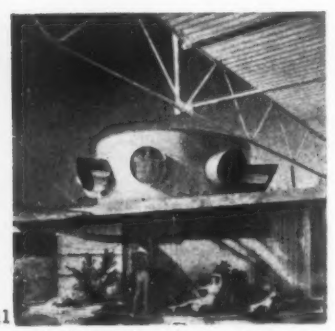
9

Dream House Dept.

If the dream car, with its clear relationship to production forecasts, plays a recognizable role in determining the shape of things to come, where, in the adjacent field of architecture, does this place the dream house as augur? Is the rectangle out—the curvy plastic, the circle and dome in—as would appear from a cursory glance at the recent crop. The most spectacular of these is the 'Saucer House,' 10, designed for Gene Bavinger, by Bruce Goff. The latter is noted for the unconventional look of many of his structures; see his house at Aurora, Illinois, on page 353 of this issue. The Bavinger essay is a series of five suspended saucers, with a common spiral roof, mast hung from a central tower whose core is a 55 ft. oil well pipe. The concrete saucers, with circular tracked curtaining, provide living spaces overhanging the sheltered ground floor, which functions flexibly as a dining, leisure and general living area, and also accommodate swimming pool.


10

Air-cooling, through the use of natural air movement where it is briskest, some way off ground level, as in the 'Saucer House,' is also employed by architect Albert Frey for a dream house in Palm Springs. 11, shows a view of the air control turret, whose ports open to catch the wind from any direction in which it blows. Ideas like these are reminiscent of Buckminster Fuller's early Dymaxion and Wichita houses, which almost always figure as obvious sources for many dream house ideas since their time. Eagle's Nest 12, a Californian project, by Joseph Wythe, uses a similar range of devices—suspended circular form, clear plexiglass outer walls—but hangs his house, in emulation of 'nature's engineer, the spider,' between two canyon walls, with access by a bridge. Novel features of this egghouse are, the ballast compartments in the under section for keeping horizontal trim, and the waste disposal umbilical tube hanging from the bottom centre.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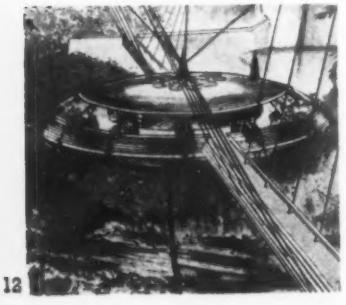
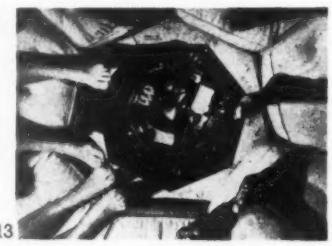
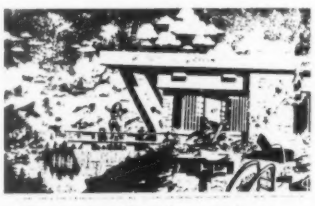
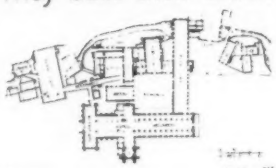

12

To come down from the rarefied air of the Eagle's Nest to the more workaday dream; R. McCulloch, Californian millionaire's new home, costing three quarters of a million dollars, is a gadgeteer's nirvana. Getting up in the morning, from the 'mechanical bed,' is taken care of by an alarm system which renders the world fit for occupancy by, switching on soft music, pulling the curtains, filling the bath, and ordering up the coffee. But the one distinguishing feature, of the house, which really ranks in the indispensable dream class—with revolving honeymoon suites in dream hotels—is the human Lazy Susan 13, which enables seven reclining passengers to broil evenly all over as it steadily revolves them in the sun.


13

Though 'Mad Magazine's' exact location between dream and nightmare might often be in doubt, it was obviously only a matter of time till they covered the dream house. Mad's subtitle, 'Humor in a jugular "vein" ' points up the dada quality of their recent dream house feature, whose ground plan 14, is, appropriately, that of Fountains Abbey.


They built their dream-


14

Arcturus IV

Designing for the hand, as touched on in an earlier section, depends very much on whose hand, how many, and which kind you are thinking of! Illustration 15, of an extra-terrestrial appendage, comes from 'Case Study: Arcturus IV,' a brilliant framing of a design problem series, initiated by John E. Arnold at M.I.T. some time ago. For the purpose of a fresh perspective on engineering design, the date is assumed to be 2951. This study is comprised of a series of communications supposedly exchanged between Massachusetts Intergalactic Traders Inc., Terran Exporting Counsel HQ. and various design consultants, on the discovery of an intelligent life form on Arcturus IV, in the α Bootis system. Conditions are set, in detail, of a methane atmosphere, high gravity and extremely cold world, which has ammonia seas, lakes of tetrasilicate, and on which plants grow upside down. Its inhabitants, called Methanians, are evolved from birds, with a similar light hollow boned structure. They have three eyes, one of the X-ray kind, two legs and two long spindly arms, vestigial wings, terminating in a three fingered claw-like hand. Reproduction is through eggs; their growth is stunted from a low energy diet and reflexes very slow. The Culture level is assumed to be around that of early 20 C. Earth, and the problem that of bringing technologically backward Methanians up to the Mid 20 C. Earth level. When the full background has been elicited, a programme is laid down and specific design problems come in from the Arcturus base. Equipment tackled ranges from, the initial base building, to house personnel in an alien environment, through farming tools, cable cars, food preparation appliances, etc., up to an 'Eggomobile' for individual Methanian transport. The latter, a particularly shrewd piece of design symbolism, in its context, is egg-shaped—to be reminiscent of pre-hatching comfort and security! Work in the reports is not entirely technical. Much is made of the Psychological Division's findings on the philosophy, history and general mores of the people, and it is demonstrated how these factors are integrated into the whole design problem. Authenticity throughout the study is kept up by the use of printed letterheadings of the various organizations, and official looking stampings of 'confidential,' etc. Enthusiam generated in the project shows in the imaginative details of the correspondence. These include personal reactions to alien diet, asides on business and friends, and incidents as in 15, where a petrified Methanian hand is concealed, with rather macabre humour, in a soil sample sent to Earth for analysis!

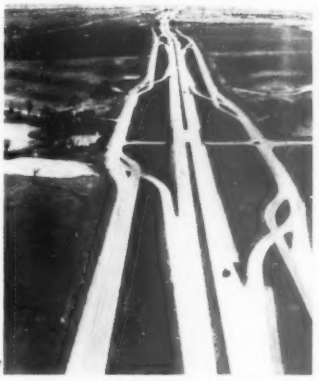
15

This study's lesson in the imaginative use of extrapolation in the setting of design problems deserves wider attention.

The auto and its environment

The more obvious zoomorphic features of the car have been belaboured, but 16, deserves a second glance, as this one peers out of a solution to the parking muddle. The whole of the bottom slab of the Medical Towers* building, by Golemon and Rolfe, at Houston, Texas, is given over to a multi-storied car cupboard. 17, of Dallas Central Expressway makes a comment on the number of subsidiary curves, and wiggles, necessary nowadays, to make even the simple straight road the shortest distance between two points.


16


17

Endpiece: tailfin of the '57 De Soto.

* See pages 330 and 332.

MACHINE MADE AMERICA

edited by Ian McCallum

The cover personage, by John McHale with the tetragram of power—Neutral, Drive, Low, Reverse—graven on his heart, was assembled from typical fragments of the cultural complex that he also symbolizes; Machine Made America. The source of material was one of America's favourite flattering mirrors, coloured magazine illustrations, and reflects a world of infra-grilled steak, pre-mixed cake, dream-kitchens, dream-cars, machine-tools, power-mixers, parkways, harbours, ticker-tape, spark-plugs and electronics. Further aspects of this world are contemplated by John McHale in Marginalia on pages 291-292, *and its impact on the world of architecture is the concern of the first part of this issue.*

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THE ARCHITECTURAL REVIEW

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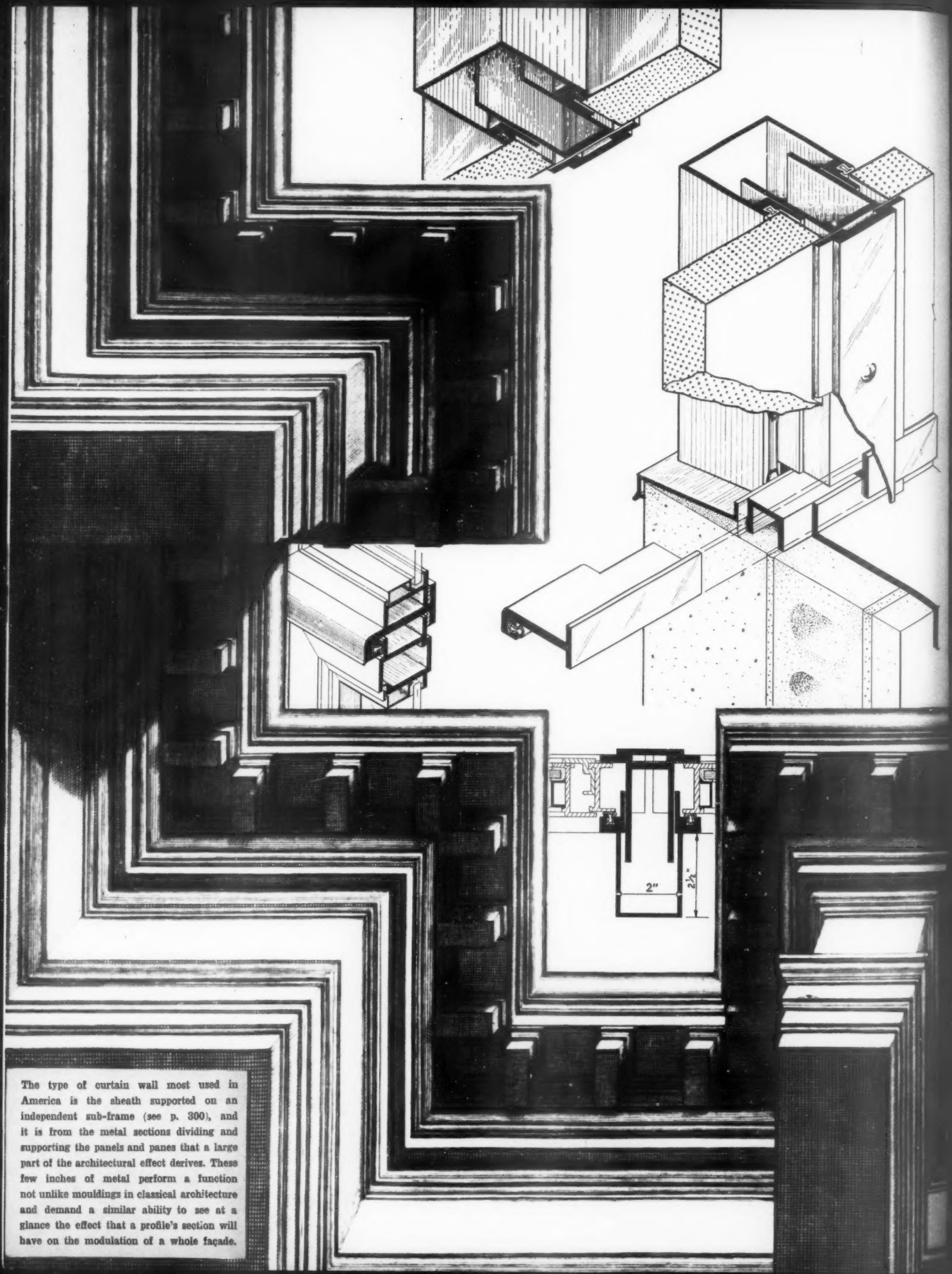
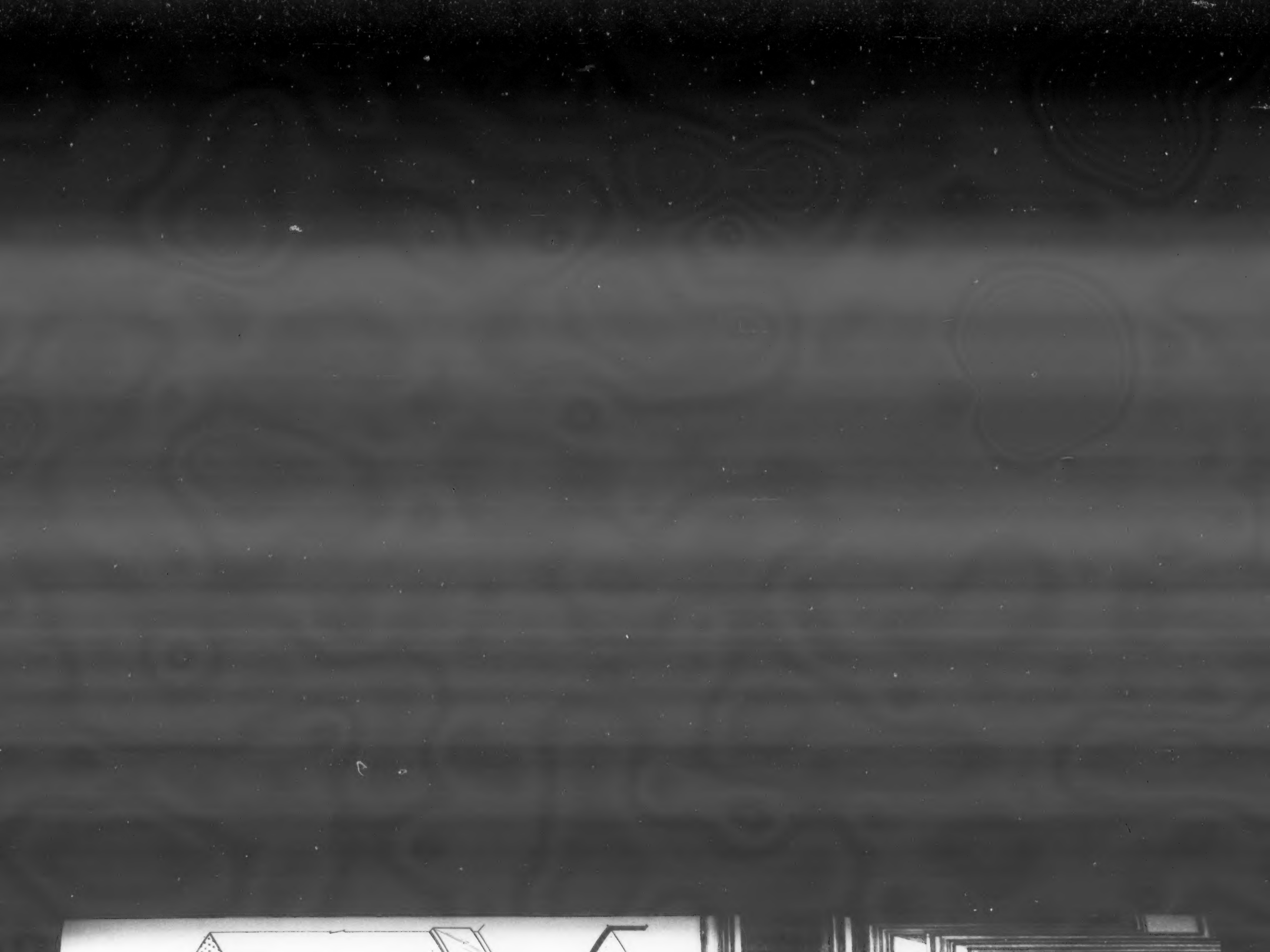
Whitehall 0611

FIVE SHILLINGS

A SPECIAL NUMBER OF THE ARCHITECTURAL REVIEW FOR MAY 1957



The type of curtain wall most used in America is the sheath supported on an independent sub-frame (see p. 300), and it is from the metal sections dividing and supporting the panels and panes that a large part of the architectural effect derives. These few inches of metal perform a function not unlike mouldings in classical architecture and demand a similar ability to see at a glance the effect that a profile's section will have on the modulation of a whole façade.



foreword

In December, 1950, The Architectural Review published a survey of the American scene under the title *Man-Made America*. Its aim was to call attention to the malignant growth of unplanned sprawl across the face of a formerly fair country. The picture was not a pretty one—neither was it unfamiliar (except in detail) for the disease is common to all highly industrialized societies of which England is an early example with, as the AR unremittingly shows, distressingly advanced symptoms. Action is, at last, being taken in both countries, if too little and extremely late. In the US there are plans for Washington, Fort Worth*, Pittsburgh, Philadelphia and Detroit, to mention only a few which, even if (or because) their objectives are limited, seem to fit current American political and economic attitudes, and therefore show promise of realization, where they are not already being realized. However, still both countries seem stunned by the magnitude of the problem they've created for themselves. Part of the trouble comes from lack of aim and expertise in face of a situation that demands a visual accounting of the whole physical environment. Architecture is an important part of the problem, but it is only a part; fortunately it, at least, has some clear-cut objectives and some people trained to reach them; as a result its gains, nowhere more evident in recent years than in America, have saved us from total visual bankruptcy. *Machine-Made America* presents, therefore, a very different picture from *Man-Made America*. The latter charted a great failure of nerve, *Machine-Made America* charts a success-story deriving from self-confidence and conviction.

In the first decade of the twentieth-century's second half, the United States of America is emerging as a leader in the art and practice of architecture. One or two other countries can boast geniuses and without their example and inspiration US architecture would be the poorer, but a corpus of architecture they lack. It is a measure of US vitality (and humility)

*See pages 350 and 377.

that it is prepared not only to learn the relevant lesson from whatever quarter it comes, but also to accept the masters from wherever they come, and greatly and deservedly has it benefited from this.

Other countries have their highlights—one or two something more—but the US by adding to generosity and a willingness to learn, wealth, industrial potential and technological skill is beginning to add a new dimension to the adventure of today's architecture —quantity.

In architecture quality derives from quantity. In music, painting and sculpture materials may be re-used or thrown away — the finished product is often the result of numerous discarded prototypes which are never seen, but buildings are scarred and bemedalled with the architects' failures and successes, and though it may be an expensive way of learning, in the end it's the only way. Architecture, then, cannot prosper without building, and building in vast quantity has been going on all over the US during the last ten years. Work put in hand annually nearly quadrupled between 1946-56, the estimate for 1956 being the enormous figure of $44,100,000,000.†

The purpose of this issue is to take stock of that expenditure in terms of the art of architecture; to assess it against the aims and ideals of the modern movement and in the perspective of current architectural achievement in the western world. Naturally the US makes its own periodic assessments, but there may be some value in a European analysis, taken as far as it can be within the covers of one issue of a magazine.

The picture of ten years of post-war reconstruction in Europe (AR March 1957) proved to be a gloomy one, but it must be remembered that it was a picture in the realist manner, a snapshot album with commentary, of what average post-war architecture in Europe is really like. The viewpoints on America in this issue have been selected to make up a picture of a very different kind, focussing not on the average but on the best.

The European picture was subtitled 'What has happened to the Modern Movement?' This survey of US architecture would seem to suggest that 'the Modern Movement has moved across the Atlantic.' But that would not be strictly fair. Had the average American architecture been illustrated a very different print would have been exposed, for though the recent American achievement is indeed formidable, it is hardly to be expected that it could leap into another dimension from Europe in the course of a few years.

It is in two respects particularly that the American picture has undergone a radical change since *Man-Made America*—both of them in the narrower field of architecture. The first is in prefabrication, where the rapid development of the curtain wall is giving partial realization to the dreams of the pioneers of the modern movement, though in circumstances and with results quite different from those they imagined—yet another example of the history of revolutions repeating itself. The second change has been brought about by a surge of creative vitality in the middle and younger generation of American architects. The basic reasons for such a phenomenon as this lie, as always, deep in the national history and psyche; on the surface one can distinguish certain contributing influences. To the ones already enumerated—the presence of some of the great European masters, both as builders and educators, the quantity of construction and rapid developments in technology—can be added the inspiration provided by engineers such as Weidlinger, Salvadori and Wachsmann and by the eternally fresh genius of Buckminster Fuller.

†1940 $8,682,000,000; 1946 $12,000,000,000; 1950 $28,454,000,000; 1954 $37,577,000,000; 1955 $41,800,000,000: US Department of Commerce figures.

From all of this, American architecture is now beginning to draw full benefit.

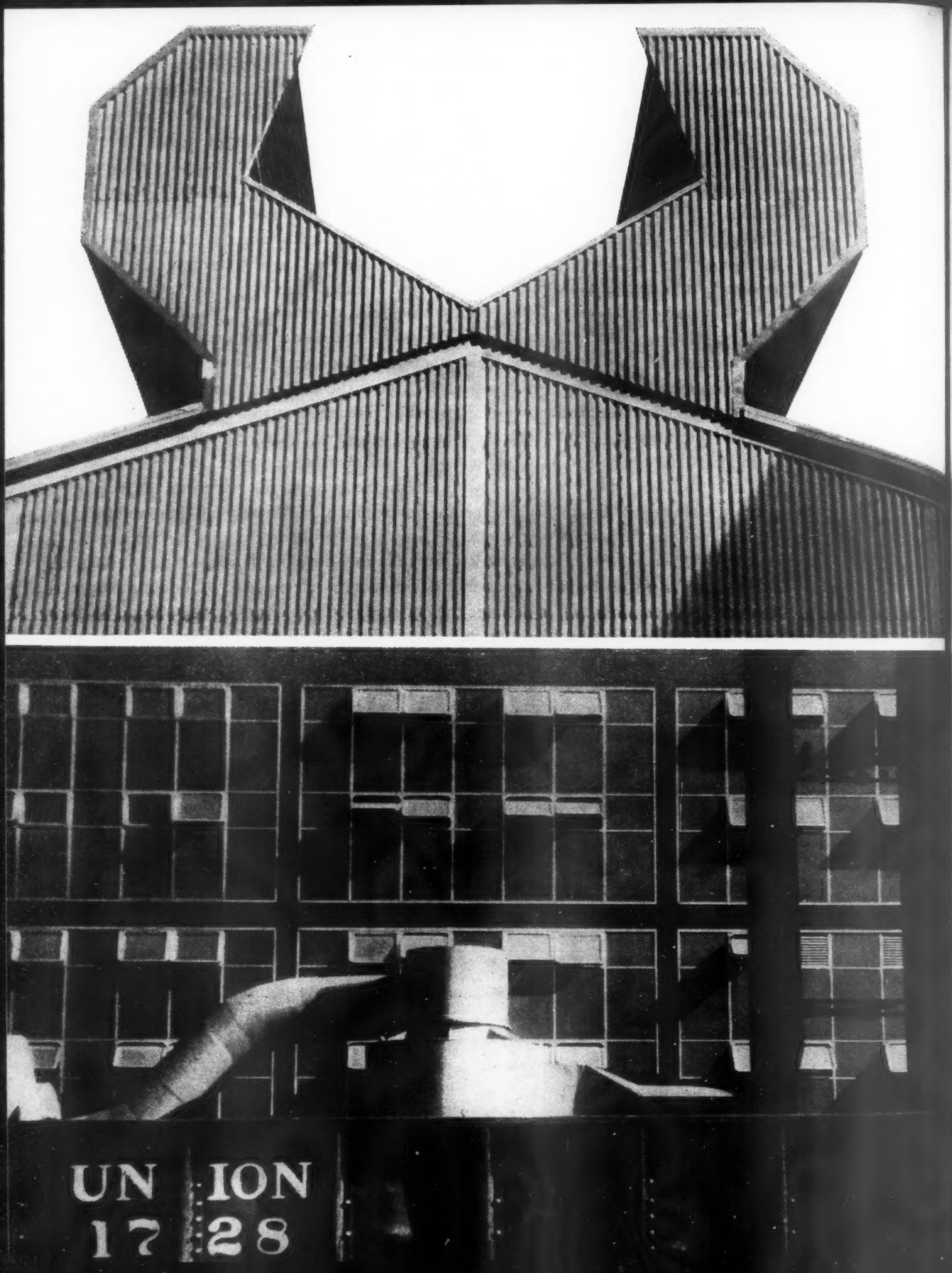
It is to two facets of the American scene that this issue is devoted—to prefabrication in the form of curtain walls—resulting in a truly anonymous idiom—and to its necessary complement, creative originality among individuals. It may be argued that the curtain wall is only a fractional part of the problem of prefabrication, of the advances made in building technology and of the challenge implicit in anonymous architecture. This is, of course, perfectly true. But in favour of its selection for illustration in such an issue as this can be listed the following: it is the first time in the history of the modern movement that a common vocabulary of form, pattern and proportion is becoming acceptable to architect, builder, client and public; it is the first time that prefabrication has been carried out on a sufficiently wide scale for it to be seen, through the incontrovertibility of balance sheets, to bring clear economic advantages. There are no other examples of prefabrication in building where, on aesthetic and economic grounds, these advantages have been made so evident to so broad a section of the community.

To the argument that other advances in building technology may have a more profound effect on architecture as a social factor and an art form, it can be answered that most of them are still in the future, however close that future may be; the curtain wall, as the survey that follows will show, is very much in the present. Considering the profound effect it is already beginning to have on the environment, not nearly enough attention has yet been paid to the aesthetic problems it raises. It is a problem common also to England‡, and will soon be common to all countries with highly-developed metallurgical industries.

Here, then, is an American experience of immediate relevance to other countries, particularly this one. And that is perhaps the decisive factor in choosing the curtain wall for examination; for this special American issue is designed to give Europeans, rather than Americans, an insight into American architecture and to present problems that are common to both, and capable of solution with available resources and within present terms of reference.

The second part of the issue—biographies illustrated by selected works of contemporary American architects—is, or should be, a challenge to Europe. The flexibility, variety and originality it shows are surely unique in the world today and, what is more, a phenomenon of relatively recent appearance. To quote 'Man-Made America': '. . . where other nations have produced out of the melting-pot some sort of shape which can be called a culture, the US melting-pot continues to seethe, its steam rising to form that eternally fascinating symbol of promise, the question mark.' Though the work shown here is an interim and inevitably incomplete selection, it is enough to suggest that the great question mark is beginning to be resolved by America's architects into a very interesting answer.

‡A survey of English curtain wall systems will be published in August.


UN ION
17 28

The industrial ancestor of all claddings is corrugated iron, still current in architecture, as in the rooftop ventilators of the Corning Glass Works, Corning, NY, opposite, top. But the degree of sophistication now possible with industrially produced cladding systems after nearly a century of development is pointed up by the black steel structure, aluminium subframes and tinted glass of the Heinz Vinegar Plant, below, in Pittsburgh, by Skidmore, Owings and Merrill.

1

THE CONTRIBUTION OF THE CURTAIN WALL TO A NEW VERNACULAR

SYNTAX

marginal

1. In 1955 a report, 'Curtain Walls of Stainless Steel,' was published by the School of Architecture of Princeton University. It was prepared in response to a request from the Committee of Stainless Steel Producers of the American Iron and Steel Institute, and was the first detailed study of the subject to appear: the definition of the curtain wall formulated in the Princeton Report was further developed at the Workshop Conference held last October under the auspices of the American Building Research Institute, and although the present article is concerned mainly with the 'sheath' type of curtain wall, since there is still much confusion over terminology, the definition is reprinted in full. (It should be emphasized that the Conference's Sub-committee on Nomenclature insisted that there is still much work to be done in drawing up an accurate nomenclature.)

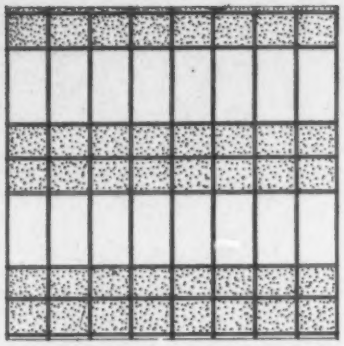
'It is believed that the first classification of curtain walls should be based on appearance. Almost any system of construction can be used to achieve any one of the common curtain wall appearances. The sub-committee believes that there are four basic *visual characteristics* of curtain wall appearance:

The pioneers of the modern movement saw the industrialization of architecture as the concomitant of a planned economy, but the curtain wall is the product of industrialization in a free one. It offers the promise—and the problems—of a new architectural vernacular; its mullions, transoms and spandrels could be the syntax of a common mode of expression that was neither bombastic nor inarticulate, and might occasionally rise to eloquence, as the 'classic' examples already do (*pages* 309-316).

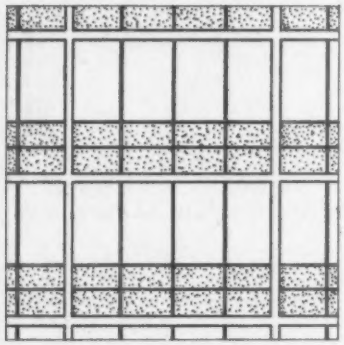
It is no exaggeration to say that the curtain wall[1] is transforming the urban environment of America. The regular grids of metal mullion and transom, empanelled with steel, glass and porcelain enamel, glitter from a thousand chasms formerly veneered with brick and stone; through the suburbs and into the countryside, too, the new architecture is spreading its regulated pattern.

Though the idea and use of curtain walls can be traced to the beginnings of the modern movement—in the sketch schemes for all-glass towers of Mies van der Rohe and in buildings by Gropius, Behrens, Dudok and many others[2]—their development as a marketed building product has taken place within the last ten

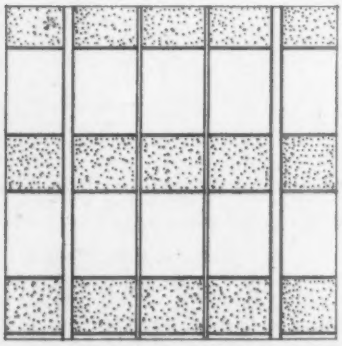
[*continued on page* 301



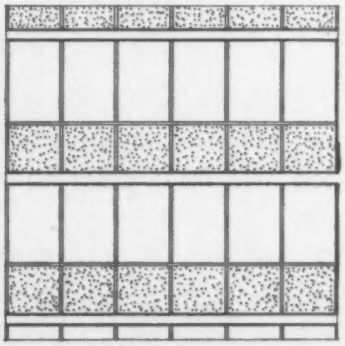
a ***sheath*** where no structural elements are indicated.



b ***grid*** where horizontal and vertical structural elements are expressed with equal emphasis.

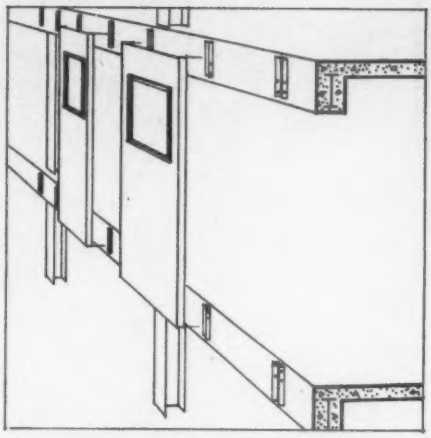


c ***mullion*** where vertical structural elements are emphasized.

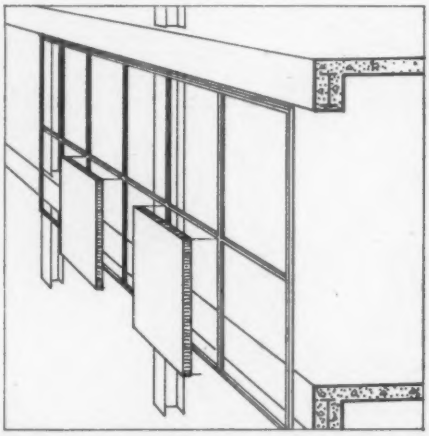


d ***spandrel*** where horizontal structural elements are emphasized.

The second classification of curtain walls should be made by ***supporting*** method. The two basic supporting methods which may be employed to achieve any of the above four designs are:

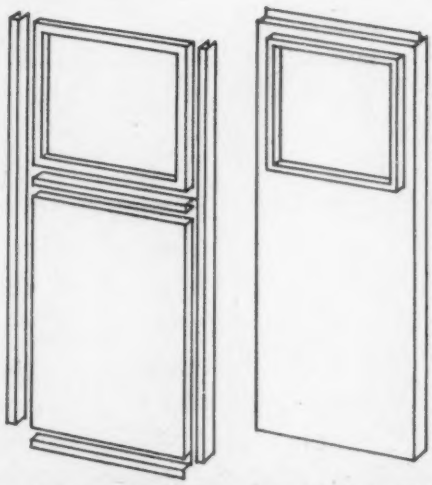


a Supporting elements integral with panel construction.



b Supporting elements as a sub-frame erected independent of the panel construction.

The ***assembling*** methods which may be employed by any of the design or support methods are:



a Assembly by parts *b* Assembly by units.

The Nomenclature Sub-committee believes that any curtain wall construction may be generally described by the use of the above system. For example, design *d*, support *b*, assembly *b*, will describe a curtain wall with emphasized spandrel elements, supported on an independent sub-frame and assembled as units for erection.

The next step was to apply a system of classification to the various joint types and sealants now in use: this classification consists of two elements:

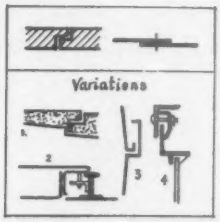
The Joint Type.

The Joint Seal.

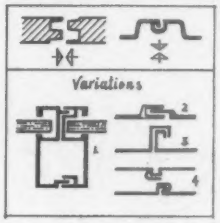
Joint types can be correctly classified by form and, in this respect, may be identified by the mechanical types. This involves two broad categories:

a INTEGRAL, in which the panel edges form the complete joint.

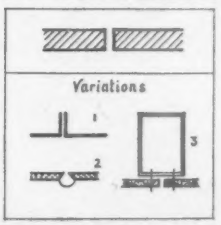
lap



mating female and male edge profiles

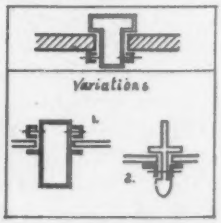


butt

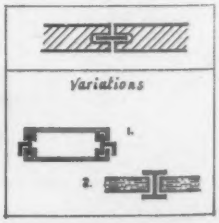


b ACCESSORY, in which extra pieces are required to complete the joint.

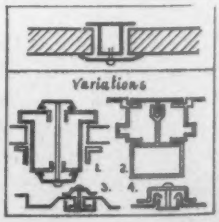
batten face applied, covers joints, may be attached to frames, panels, clips, or opposite batten.



spline edge applied either internal or external.



frame and stops the frame may or may not be structural.



Joint seals may be broadly classified into Non-Rigid and Rigid types. Under the Non-Rigid type, we have:

Mastic fillers, which may be site or shop applied.

Gaskets, which may be of the mastic or resilient types such as the polymers, felt, pile.

Cover tapes.

Metallic strips, spring or interlocking.

And under the Rigid type we have:

Bonded—with two classifications: metallic or non-metallic.

Metallic would be welded: non-metallic a chemical adhesive or chemical bond.

From the *Architectural Metal Curtain Wall Workshop-Conference:* October 1956—Building Research Institute, National Research Council, Washington, D.C.

2. Most of the early examples of the sheath curtain wall are, in fact, all-glass walls, though the spandrel (a term not used for this unit in England, where it is usually described as the under-cill or cladding, panel), was sometimes backed-up internally by an independent inner wall (Peter Jones, Sloane Square, London) and this is sometimes still unavoidable (Lever Building, New York) for the reasons given in (4) below. However, the tendency is for curtain walls to incorporate factory-made spandrel panels, with exterior and interior finish and insulation, built-in (General Motors Technical Centre, Warren, Michigan).

3. The comprehensive and unique catalogue service which was started fifty-two years ago by the F. W. Dodge Corporation. Almost fifty-four million catalogues connected with products and services of the building and industrial markets were classified and distributed this year in standard bindings to selected individuals and firms. The Architectural File was of invaluable help in assembling the material for this article.

4. At the present moment in America a number of advantages of the curtain wall are offset by building codes (particularly those connected with fire hazard) that require back-up walls behind the spandrel, of more solid construction than the sandwich panel.

5. A performance specification for the ideal curtain wall was proposed in the Princeton report (see 1) and is reprinted below (values less than ideal which would be acceptable in most cases are given in parentheses):

Durability life 100 years (minimum 40).
Thickness 2 in. (maximum 5 in.)
Weight 5 psf (maximum 15).
Insulation U=0.05 Btu (maximum 0.15).
Fire Resistance incombustible (2 hours where required).
Strength resist 150 mph wind (minimum 100 mph).
Weatherproof on outer face.
Vapour proof on inner face.
Ventilated and drained for control of internal moisture, whether from condensation or from wind-driven rain.
Ventilated for summer cooling.
Flexible provide for expansion and contraction and building movement.
Removable panels easily removable for repair or replacement.
Sound Transmission reduction 50 db (minimum 25).
Sound-deadened against impact of rain and wind.
Size large units, 25 to 100 sq. ft. (minimum 10 sq. ft.).
Adaptable to all types of building framing—steel or reinforced concrete simple or cantilevered.
Erection installed from inside the building—no outside scaffolding required.

continued from page 299]

years, and it was not until 1956 that they achieved a separate category of their own in Sweet's catalogues.[3]

So far they have commended themselves to their users on grounds of lightness (by comparison with masonry and brick), thinness (providing extra usable floor space) and economy (in the cost of the wall and in the speed of erection).[4] Their chief drawbacks, now being gradually overcome, are the complexities involved in making allowance for expansion and contraction, weatherproofing of joints and the experimental nature of some of the infill panels used.[5]

The aesthetic of the curtain wall holds both a threat and a promise. The threat derives from the extraordinary speed of its development. The necessity for such an application of technology to building was continually canvassed by the pioneers of the modern movement,[6] and they can hardly be blamed for failing to envisage exactly what aesthetic problems commercialized prefabrication would bring; they were not to know how, when and where it was to come about; they were not to know it would be the external envelope that would first receive attention on a large scale. They hoped, presumably, that it would come about rather earlier than it has, and with their direct participation. However, the first stages of commercialization have taken place largely without the close participation of architects, and, as a result, many of the designs lack finesse. The threat lies in accepting this uncritically, and permitting such designs to achieve the status of the standardized before they deserve to.

In England precisely the same danger threatens, though the situation is to some extent ameliorated by post-war experiments in prefabrication initiated by architects, and carried through with the closest collaboration between them and the manufacturers. The Hertfordshire experiment has provided case-studies in prefabrication which will be of value for many years to come. But most of the Hertfordshire schools were single-storey and like the Ministry of Education multi-storey schools, house the structural frame in the external wall; they are not curtain walls of the sheath type with which we are mainly concerned here. The London County Council has used a standard sheath curtain wall for some of its schools (e.g. Catford) which has a remarkable degree of elegance and refinement. The type used at Catford, in company with other standard English curtain walls, is of much lighter construction than the American counterpart. Several reasons have been proposed for this, (a) that many standard American curtain walls are designed to be prefabricated in larger units; (b) that the American walls are designed

for greater maximum wind stresses,[7] and (c) that there is more concern in America for saving on labour costs than on cost of materials. Nevertheless, both here and in America, the best looking curtain walls, whether heavy or light, would seem to be those (one-off and standard) designed by architects working in close collaboration with engineers and technicians, or those standard ones which have most closely followed their lead.

In America the curtain wall has a more directly industrial parentage. The urgent need for economy and increased speed of erection of buildings producing, storing and housing the second world war effort encouraged mammoth firms of architects and architect-engineers like Albert Kahn, Austins, and Giffels and Vallet to exploit the advantages of dry construction. In big factories, storehouses and hangars corrugated metal sheeting was extensively used for external walls, entirely sheathing the often windowless buildings. After the war detailed analyses of these systems[8] led to improvements and launched their application not only to the industrial but also to commercial buildings, finally leading to the framed metal curtain wall.[9]

It is unlikely that the popularity of the curtain wall in America would have been so sudden but for the operation of other factors than the technical and economic. It is hard, so near in time, to detect the decisive factors. There were, of course, many practising architects well aware that the logical enclosure of the skeleton frame was a light envelope, and well aware also that the technical difficulties in its way were gradually being overcome. But, as ever, developments awaited the added stimulus which comes from that imponderable factor, popular aesthetic

[*continued on page 307*

Attachment to building simple and positive—adjustable in 3 dimensions.
Handling easy, preferably by manpower only.
Shipping easy, by standard transportation.
Fabrication simple—can be done in any reasonably well equipped fabricating shop.
Appearance attractive—no waviness, not too reflective, wide variety of textures and colours, weathers uniformly, self-cleaning.
Maintenance none required—no painting, caulking or refinishing—cleaning not required for durability or appearance—cleaning easy if desired.
Cost moderate—competitive with conventional construction—maximum $5 per square foot in place.

6. See pages 302 and 307.

7. American walls (see 5) are designed for 150 m.p.h. wind loads, while, in England, the figure seldom exceeds 75 m.p.h.

8. The following account given at a conference on Metal Curtain Walls organized by the American Building Research Institute, and held in Washington on September 28 and 29, 1955, is by John O. Blair, Division Architect of the Detroit Edison Company, and describes a study made after the war, of the comparative costs of masonry and metal curtain walls:

'. . . 30 types of 8 in. and 12 in. masonry curtain wall sections were developed, . . . Two types of field or shop fabricated metal panel units were investigated . . .

'The total unit costs per sq. ft. of wall surface . . . for masonry curtain walls varied from $3.39 to $7.69, . . . The total unit cost for metal panel construction using electro-galvanized steel for the inside face, 1½ in. fibreglass insulation and fluted aluminium for the outside face was estimated at $2.75 per sq. ft. of wall surface. Using stainless steel in the same section, in place of aluminium, our estimate was $3.85.'

9. The following comment on the use of the framed metal curtain wall is contributed by Angus McCallum of Kivett and Myers and McCallum: architects Kansas City:

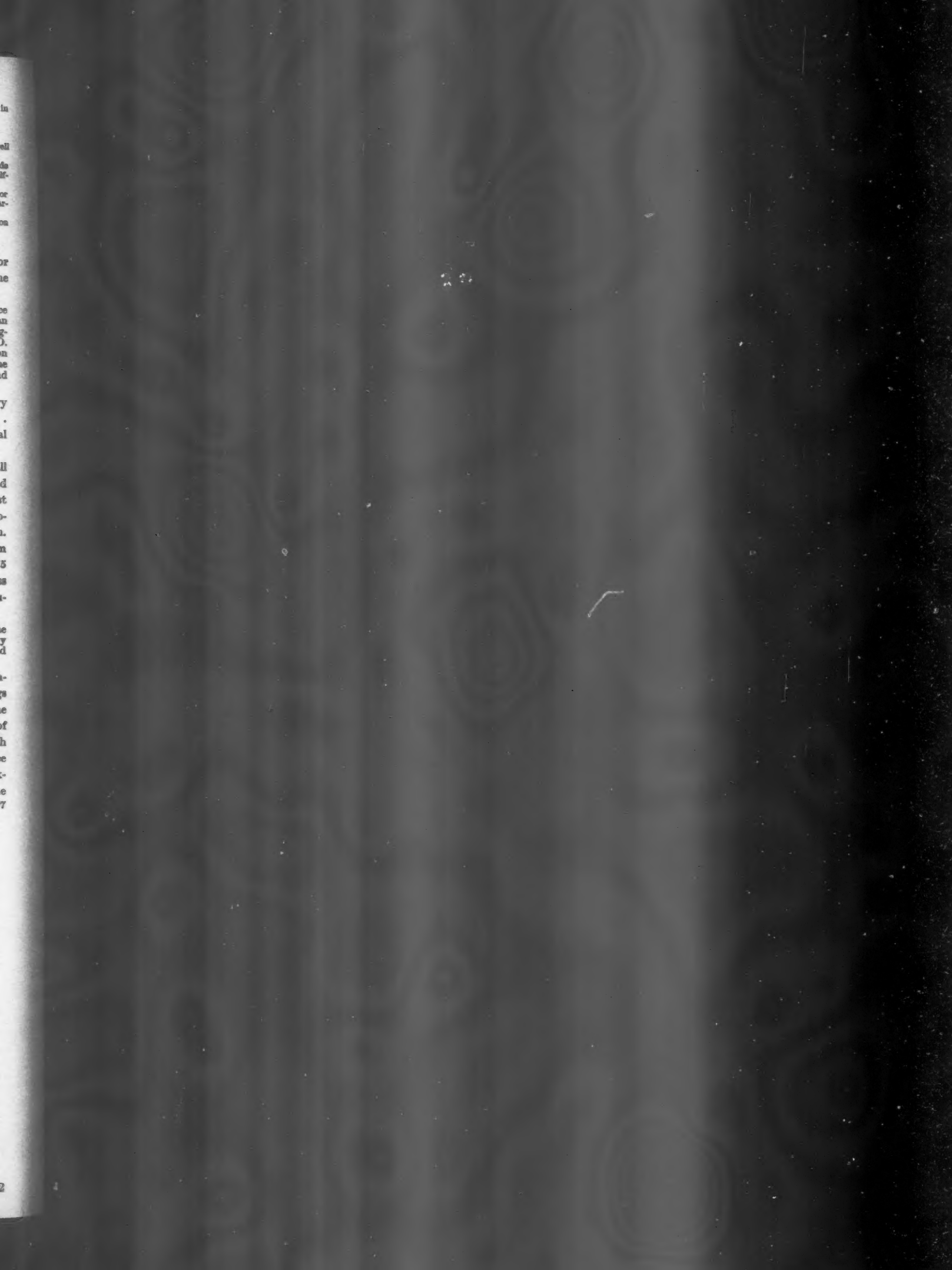
'We have employed "window wall" construction in quite a wide variety of buildings for the past ten years. The cost of the insulated panel portion is greater than that of the more conventional masonry wall with simple interior finish, but the saving in space (approximately three inches overall wall thickness, against eight to twelve inches), the

[*continued on page 307*

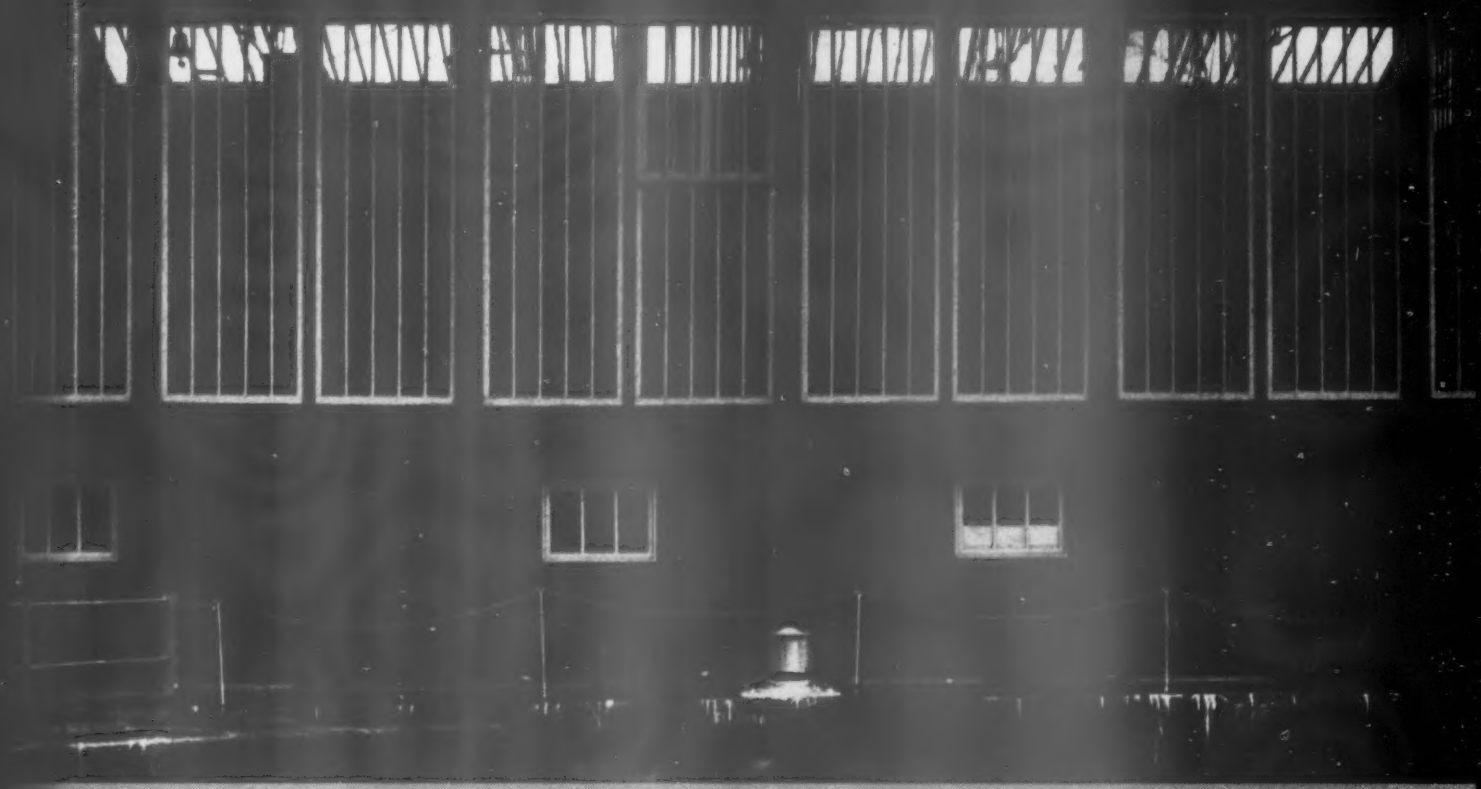
manifesto

"It would seem as if in our day, when machinery and manufacturers supply every want, town building ought to be erected without occasioning any inconvenience... and with the precision which modern mechanical appliances insure. It is evident that very much still remains to be done if we would derive from these mechanical agencies all the advantages the public have the right to expect....
"As machinery is now so extensively applied in the manufacture of large rolled iron, what should be avoided is the multiplication of patterns, which necessitates frequent changes in the operations of the workshop. A smith will make fifty pieces to the same pattern more cheaply and rapidly than if each piece required a special pattern: and when it comes to the fixing there is less chance of the work not fitting, or of mistakes in it." *VIOLLET-LE-DUC 1864*

"If we are to make iron our main constructive element we must break with the old traditions of brick and stone, and adopt a method of design more suitable to the new material. It has often struck me that the half-timber work of the fifteenth and sixteenth centuries contains many suggestions for this new way of building. In the first place it is a ***trabeated*** style in the literal sense of the word, a style of posts and beams....
"Why should not the superstructure of the shop-front be framed with a skeleton of iron filled in with nogging or thin hollow walls, faced perhaps with glazed bricks in colour, for enclosing the habitable part of the house." *T. G. JACKSON 1906*



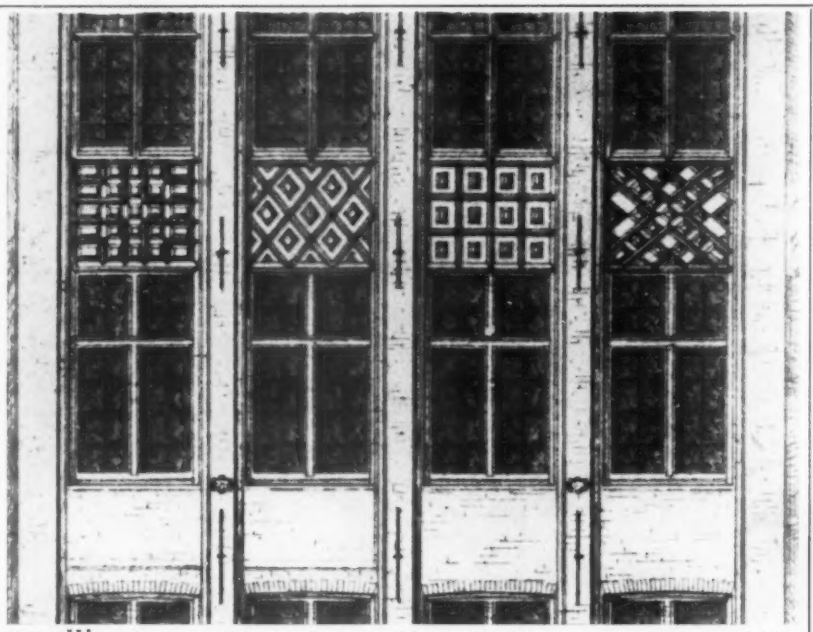
Industrially, the frame-and-fill construction that opened the way for curtain-walls is as old as the Functional Tradition, and survived the change from wooden construction to iron frames in the



middle of the last century—the old Chatham Dockyard Museum above, 1867, and the Sheerness Boathouse below, 1861, both cast iron, show frame-and-fill on the threshold of industrialisation.

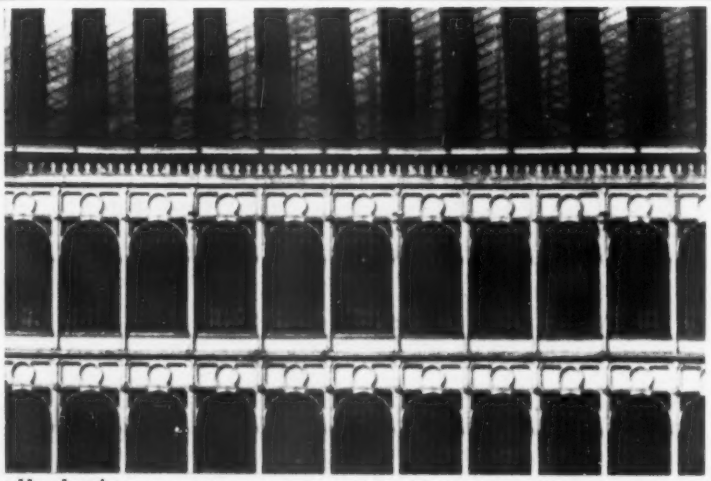
elements **of curtain wall design abstracted from the past**

repetition, *inseparable from standardization, is often castigated on grounds of monotony in theoretical discussions about architecture, although in practice it often proves a highly admired attribute. The Palais Royal, Paris, above, is a standing example of the contribution that repetition can make to a sense of urbanity.*

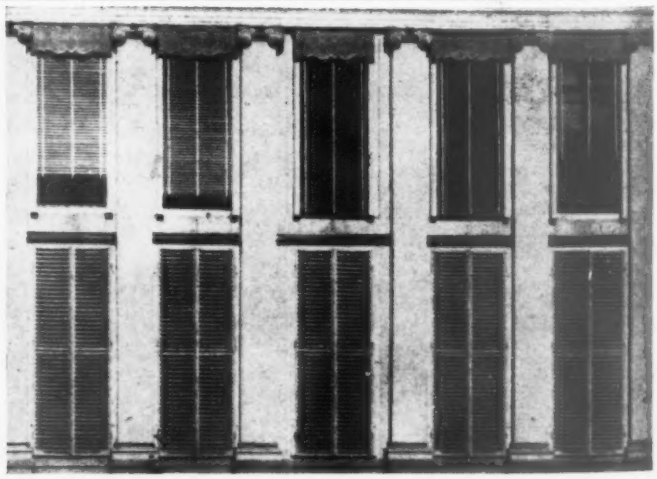


panelling *is an essential part of most prefabricated building systems, and the panel below the window (known as the spandrel in the US) is often the only place left for texture, pattern and colour; the consequent temptation to elaborate this space (as in the Dutch sixteenth-century example above) is particularly harmful to a style which derives its qualities from restraint and simplicity.*

trabeation *is an element shared by both wood and metal systems of construction. This sixteenth-century house in Hanover shows an affinity with contemporary curtain wall construction not only in the rectilinear pattern but also in the flush surfaces.*



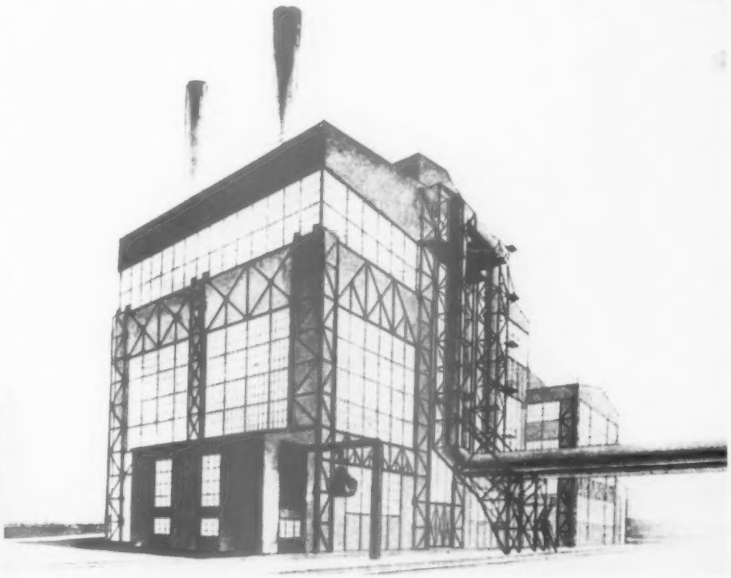
all-glazing *is not by any means universal in curtain wall construction, and it can raise serious insulation problems, although, as the examples on the next two pages show, it was the most influential single element in popularizing the idea. The Crystal Palace, 1851, above, based its glazing technique directly on greenhouse precedent; the curtain wall generally derives from the metal window manufacturer.*



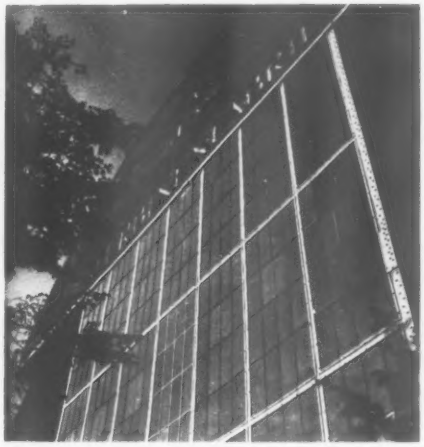
profiling *is one of the least studied and most important elements in the design of curtain walls. Wherever architecture depends for its effect on plain surfaces and shallow relief (as does this seventeenth-century Dutch house), the depth and profiling of what projections there are is of first importance; in the handling of light and shade contemporary designers still have much to learn.*

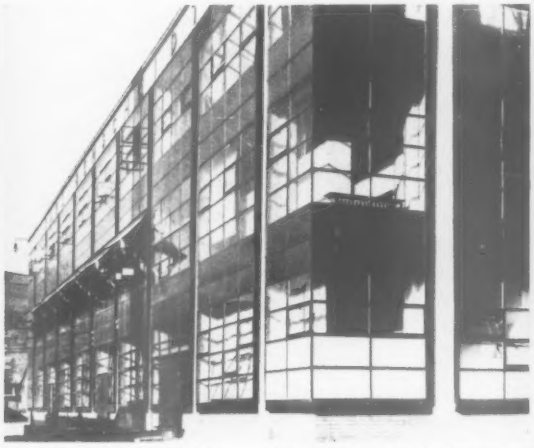
antecedents of the curtain wall from Viollet-le-Duc to Mies

Viollet-le-Duc, taking mediaeval timber framing as his point of departure, visualized diagonal bracers across the faience filled panels of his iron-frame design of 1864, 10. *The idea has not prospered, and its reappearance in Dmitriev's Don Basin Power-station,* 11, *of* 1926–27, *is rare in this century.*



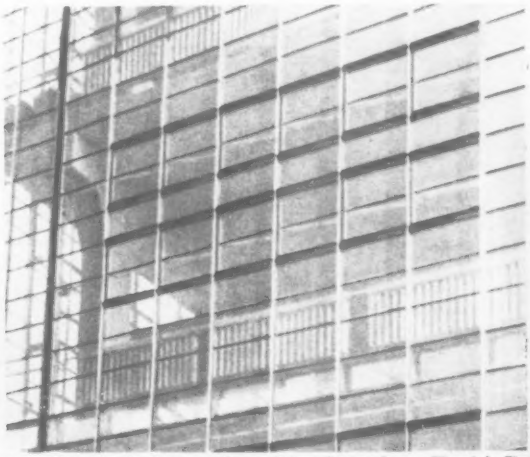
10, 11





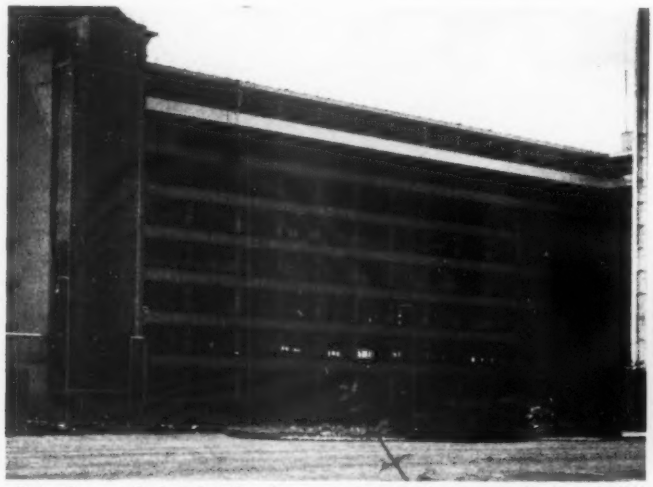
12, 13, 14

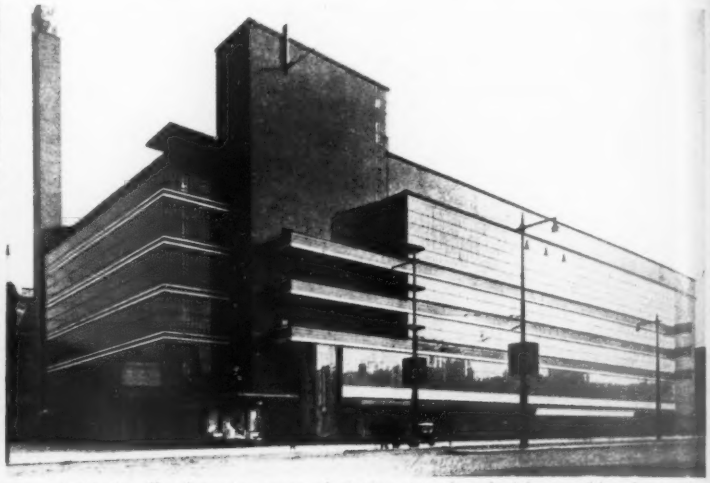
The architectural approaches to the all-glass curtain were made in the first twenty years of the century, in Behrens's Turbinenfabrik *of* 1909 *in Berlin,* 12, *and in the Fagus Factory at Aalfeld,* 13, 1911–13, *by Gropius and Meyer. In both of these, the glazing appears as discontinuous inserts between the structural members, but a true curtain had already appeared in Willis Polk's Halliday building in San Francisco in* 1915, *the prime US pioneer work,* 14.



15, 16
17, 18

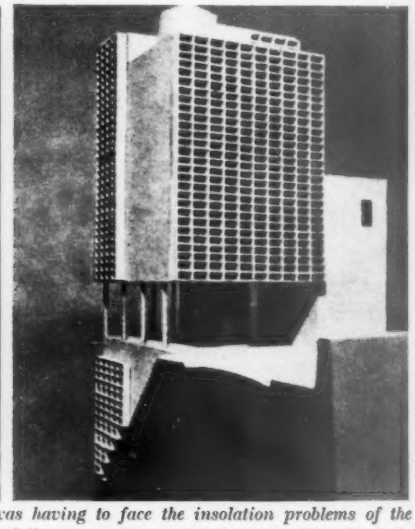
After 1918, *true curtain walls of continuous glazing proliferated in advanced architectural circles, Mies leading the way with his glass tower project of* 1926, 15, *Gropius following with the Bauhaus machine shop,* 16, *in* 1926, *and then Kysela's Bata shop in Prague,* 17, *and another Czech example of* 1928, *Cermak's tower for the Brno exhibition,* 18, *a very pure use of the glazed curtain, and one that anticipated very closely the solutions evolved by Mies.*





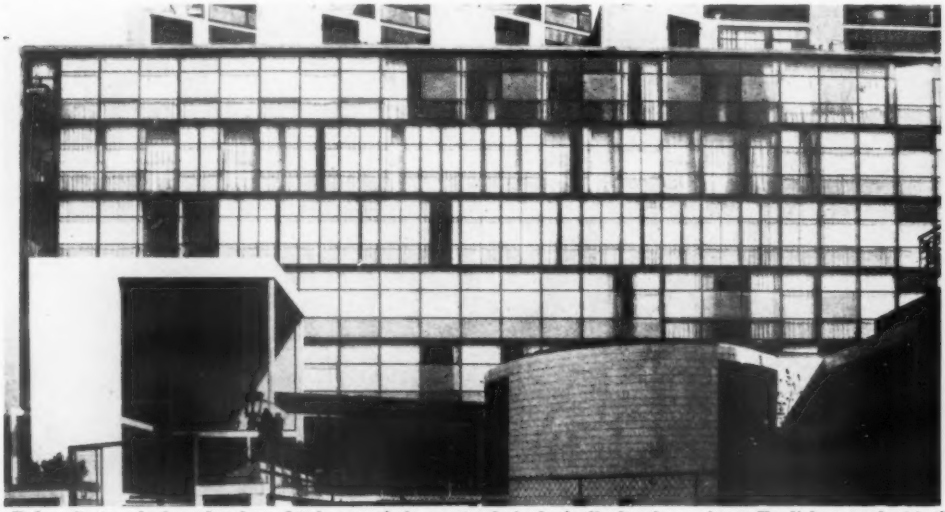
19, 20

It is often overlooked that the pioneer work in glazing-over really large building surfaces was done in and around Rotterdam; Brinkmann and van der Vlugt's van Nelle factory, 19, *dates back to* 1924, *while Dudok's* de Bijenkorf *store of* 1929–30 *offered greater areas of glazing,* 20, *than had been achieved even by Erich Mendelsohn up to that time, even though Dudok only uses them to skin over projecting elements, not to wrap the entire visible volume of the building.*



21, 22

The full possibilities, and the unavoidable penalties of overall glazing began to be appreciated in the early Thirties—the decade opened with maximum exploitation of the light glazed box, 21, *in Asplund's Stockholm Exhibition buildings, but by* 1932 *Le Corbusier was having to face the insolation problems of the* pan-de-verre *and fit* brise-soleils, 22, *to his project for a dwelling block in Algiers, thus producing one of the earliest emphasized facade grids.*



23, 24

Before it, too, had sunbreakers fitted, one of the most admired of all glazed curtains was that of Le Corbusier's Cité de Refuge, 23, *in Paris, completed in* 1933. *But the truest anticipation of the industrialized curtain wall is to be seen in an English example,* 24, *the Peter Jones store in Chelsea, completed in* 1938, *to the designs of Crabtree, Slater, Moberley and Reilly, where the rhythm of glazing and spandrel is close to the industrial versions of the Fifties.*

manifesto

"A type can originate everywhere when identical needs exist....When a population has identical needs it stands to reason that types develop."

OSTHAUS 1912

"We can see the new structural principles most clearly when we use glass in place of the outer walls, which is feasible today since in a skeleton building these outer walls do not actually carry weight. The use of glass imposes new solutions."

MIES VAN DER ROHE 1922

"Industrialization of the processes of construction is a question of materials. Our first consideration, therefore, must be to find a new building material. Our technologists must and will succeed in inventing a material which can be industrially manufactured and processed and which will be weatherproof, soundproof and insulating. It must be a light material which not only permits but requires industrial production."

MIES VAN DER ROHE 1924

"The creation of standard types for everyday goods is a social necessity. The standard product is by no means an invention of our own era. It is only the methods of producing it which have changed. It still implies the highest level of civilization, the seeking out of the best, the separation of the essential and super-personal from the personal and accidental."

WALTER GROPIUS 1935

continued from page 302]

reduction of weight of exterior wall construction and consequent saving in structural members, relative speed of field erection as against masonry, the fact that enclosure of the building can proceed in temperatures unsuitable for masonry work—all these are factors affecting our use of this construction.'

10. 'A vast marble frame for two enormous windows . . . a mosaic reflecting the sky from a thousand facets.' *The Magazine of Building*, June, 1949.

11. 'The . . . imaginative and public-spirited Lever House whose slim office tower of glass and steel . . . is raised on a table of restaurants under whose legs New Yorkers may pass the time of day, to the sound of splashing water and traffic in one of the densest and most expensive districts in the city,' F. Atkinson in *The Listener*, March 18, 1952.

12. Below are two examples of Lever's impact on Europe. First, a design for an office building in the City of London.

Second, offices for the Kaufhof Company in Cologne, Germany.

continued from page 302]

appreciation. Without doubt, a powerful influence was the completion of the United Nations Secretariat; here for the first time was an all-glass curtain wall on the American scale, and it made a powerful impact on public, critics,[10] architects and manufacturers. Architect's visions are all very well for other architects, but, for the man in the street and the man in the executive suite, architecture has to rear its head before their pulses quicken. With the completion of the Lever building two years later their pulses began to race. Few buildings of the twentieth century have drawn so ardent a response from all sections of a community and few have so acted upon visitors of the most diverse interests and backgrounds, from other communities.[11] Where the Lakeshore Drive apartments with their subtleties of modelling and historical associations can make an immediate appeal to architects but demand an effort from the public they do not always get, the Lever building seems to offer a direct line of communication. This may be an explanation of why most of the marketed curtain walls strive for an effect of flatness rather than relief in the façade, and why in so many of them the scale and proportions of the frames and panels seem to relate to the Lever prototype rather than to any of the earlier experiments or other current models.[12] Already the effect of flatness is receiving criticism from some quarters[13] and it will be interesting to see whether the Miesian modelling of the façade or the more pronounced effect of some type of sun-shading will be developed next by the manufacturers, or whether the glittering effect of the sheath-like envelope will win over its critics. This depends, to a large extent, upon the success achieved in raising the standard of appearance in scale, proportion and modelling of many of the current marketed walls.

SYNTAX

So far we have considered only the history and the present problems of the curtain wall, but there are implications for the immediate future, even more interesting. It sometimes happens that when an idea, for long subscribed to in theory, proves itself workable in practice, a number of other ideas suddenly fall into place alongside it: the development of the curtain wall holds just such a promise.

It is an awkward but inescapable truth that the architecture of an age is judged by its weak as well as its strong links. Ever since the breakdown of classical discipline in the romantic movement and right up to the present, architecture's weak links have been very weak indeed. An age or a nation may or may not produce its geniuses, there is nothing at all you can do about it, but if the average man is left without terms of reference, codes of practice, vocabulary or pattern book, he flounders. And the average man, architect, builder, handyman and client has been left to flounder now for nearly a hundred and fifty years without any clear architectural terms of reference. No evidence is needed to support this; it lies all around us. Loud has been the complaining by those who think they know better, and ludicrous the attempts to redress it by forms of aesthetic control, nearly always rebounding on to those who least require it. Yet, surely, if it is to succeed, aesthetic discipline, like all other kinds, must be accepted willingly.

The curtain wall is the first sign of such a discipline presenting itself to modern architecture and being generally accepted. It has been observed that it has a 'low emotional content'. Is this a matter, though, for complaint? One of the most unpleasant aspects of our environment today is the litter of buildings attempting to express an emotional content that their designers were neither capable of feeling nor understanding. There is a saying "An artist is not a special kind of man, every man is a special kind of artist." This may well be true if you broaden the definition of artist until it becomes almost meaningless. But if you mean an original creator, a frontier pusher of the intellect and imagination or, in architecture, the man with the 'plastic eye' who can conjure with space, then surely the gift is rarely given.[14] To a slightly larger number is given the ability to take a lead and make something of their own out of it; to the rest is given the ability to acquire all kinds of skills of inestimable use, whether in research, manufacture, assembly, organization or a thousand other essential parts of the building operation.[15]

In the *Lamp of Sacrifice* Ruskin said "It is very necessary . . .

[continued on page 317

13. '. . . the single plane is the type of most of the curtain-wall buildings in this country, and it is our own belief that over the coming years we will see a marked departure from this fetish for flatness. This will happen not only on aesthetic grounds, because there is certainly a dreariness in flatness when repeated without relief, but also on human grounds, since the flat walls do not accomplish as filters the best results in filtering in and out desirable and undesirable environmental factors.

'The economic factors are strong. The Olgyays have demonstrated that . . . an expenditure of from $4.00 to $9.00 per square foot for shading devices will pay its way through savings in air-conditioning costs alone. It is our conviction that we will be building many more buildings having façades with depth than we did in the past, with of course a great effect on curtain-wall design and fabrication.'

Robert W. McLaughlin, Director of the School of Architecture, Princeton University, speaking at the Conference referred to (in 8) above.

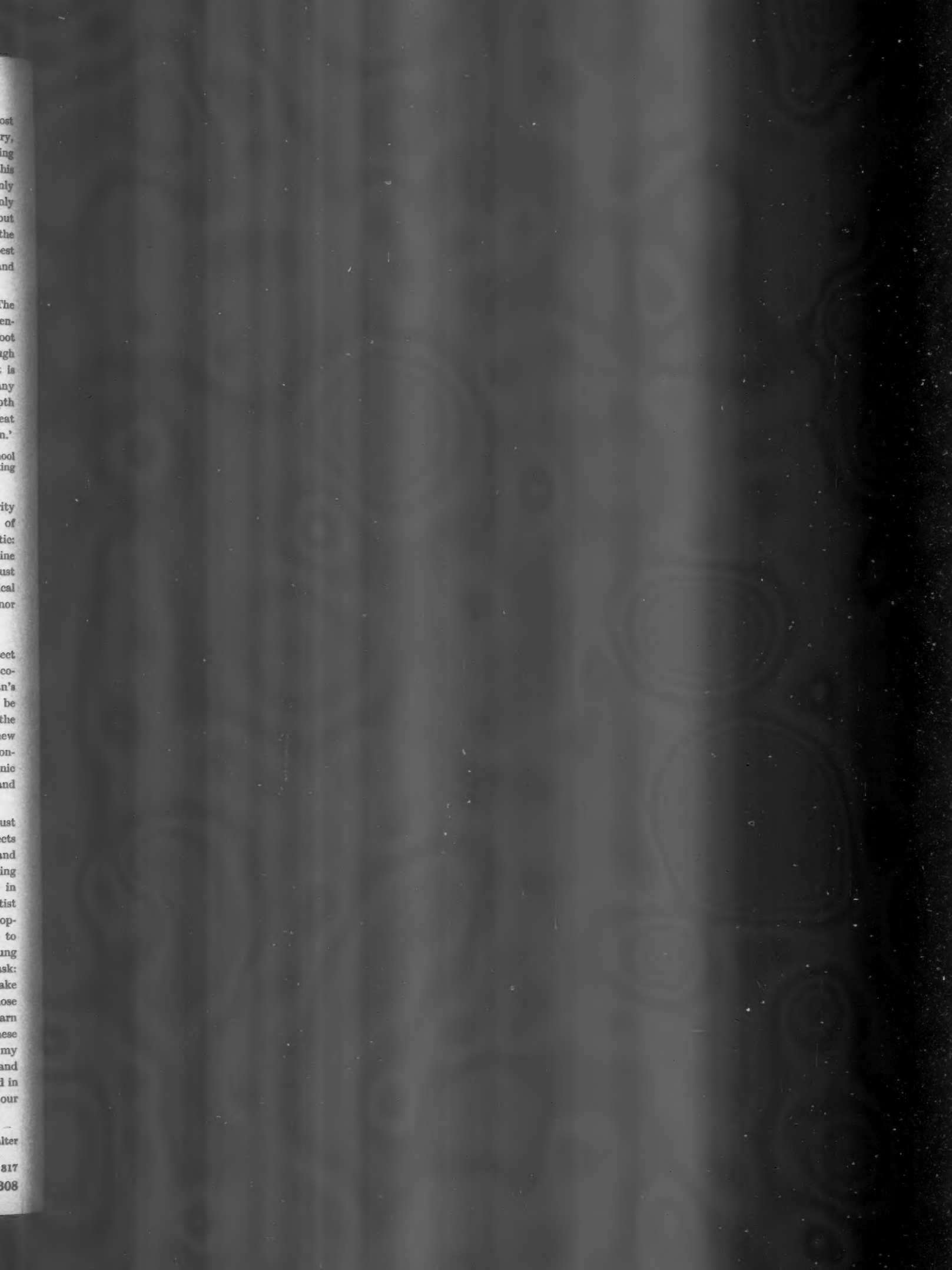
14. It can honestly be said that this rarity is a blessing. An environment made up of masterworks would be tedious and chaotic: submission to the kind of aesthetic discipline that standardization provides would be just as much of a necessity in such a hypothetical situation as it is in our own chaos of 'minor and minus works.'

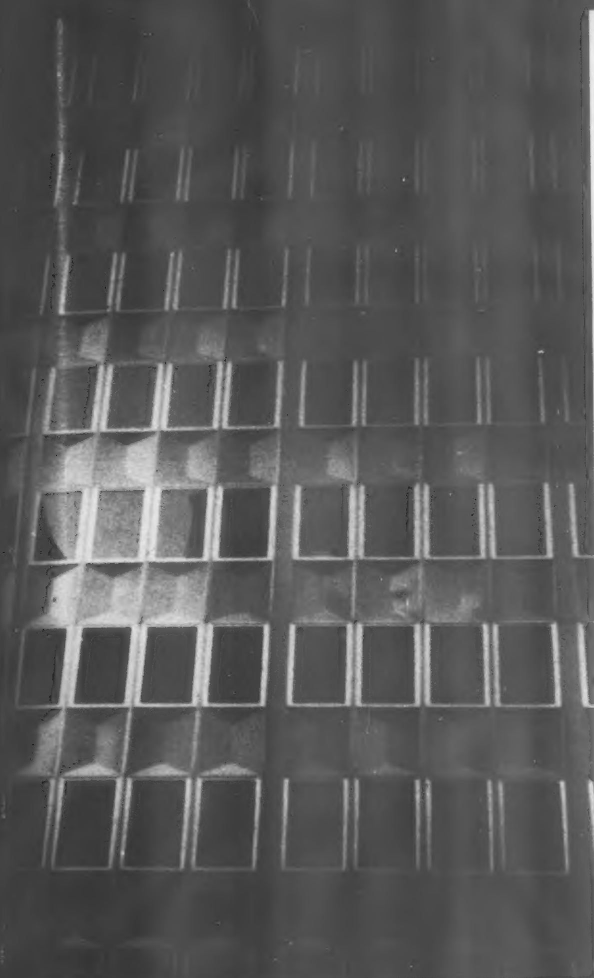
15. '. . . the historical mission of the architect has always been to achieve the complete coordination of all efforts in building up man's physical surroundings. If he wants to be faithful to this high mission, he must train the rising generation in conformity with the new means of industrial production instead of confining them to a training at the platonic drafting board, isolated from making and building. . . .

'. . . to be honest with ourselves, we must admit that only relatively few of us architects have directly taken part in influencing and performing this great change, or in designing those component parts which we all use in building. It is the engineer and the scientist who have been instrumental in this development. That is why we have to speed up to regain lost ground by training our young generation of architects for their twofold task: 1, to join the building industry and to take active part in developing and forming all those component parts for building, and 2, to learn how to compose beautiful buildings from these industrialized parts. This presupposes, in my opinion, much more direct participation and experience in the workshop and in the field in contact with industry and builders than our usual training provides.'

Scope of Total Architecture, by Walter Gropius. George Allen & Unwin, 1956.

[continued on page 317





U.N. Secretariat, N.Y. 99, Park Avenue, N.Y.

860, *Lake Shore Drive, Chicago*

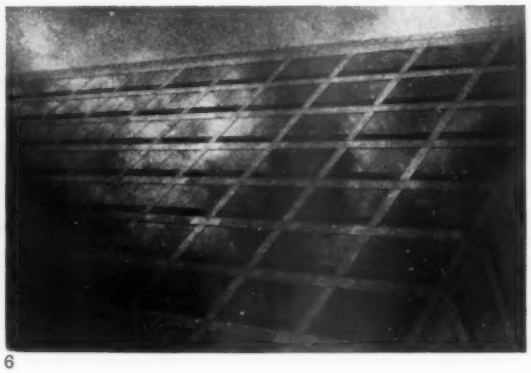
The tourist's view of US curtain walls: five shots of four buildings snapped by visiting British architects.

Lever House, Park Avenue, N.Y.

U.N. Secretariat, N.Y.

grid walls.....

EQUITABLE SAVINGS AND LOAN BUILDING, PORTLAND, OREGON. *ARCHITECT: PIETRO BELLUSCHI.*



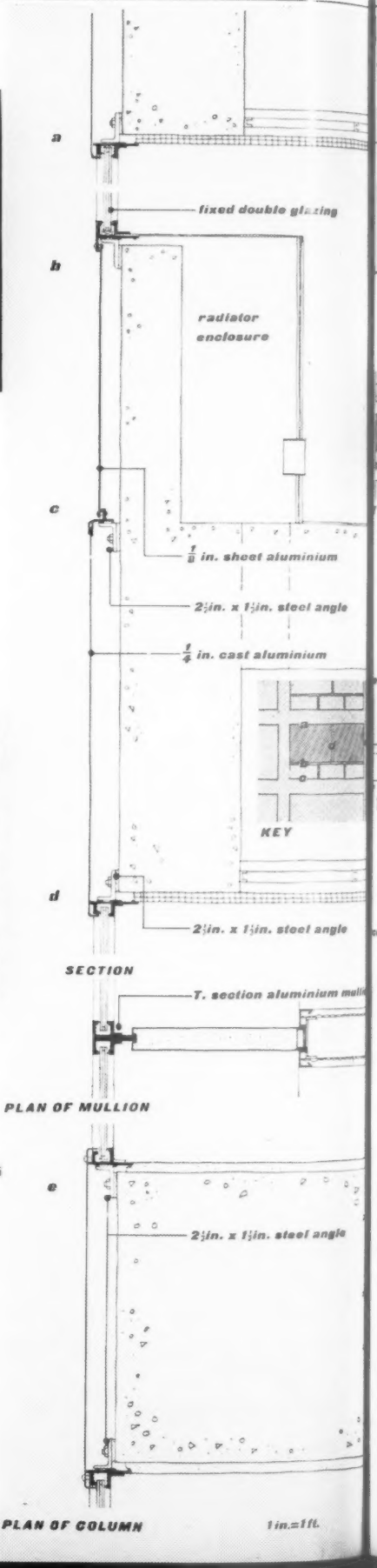
6

An early example in American office buildings (1948) of the reflecting surface. As in the Mile High Centre, opposite, the structural frame is housed in the external wall; here, by bringing glass, mullions, transoms and spandrel panels into the same plane as the polished metal facing of structural columns and beams, the architect has given his building some of the characteristics of the sheath-type curtain wall, though the introduction of structural members into the façade creates more complex rhythms. This type of wall is not always defined as a curtain wall, though authoritative American sources (see page 300) do so define it.

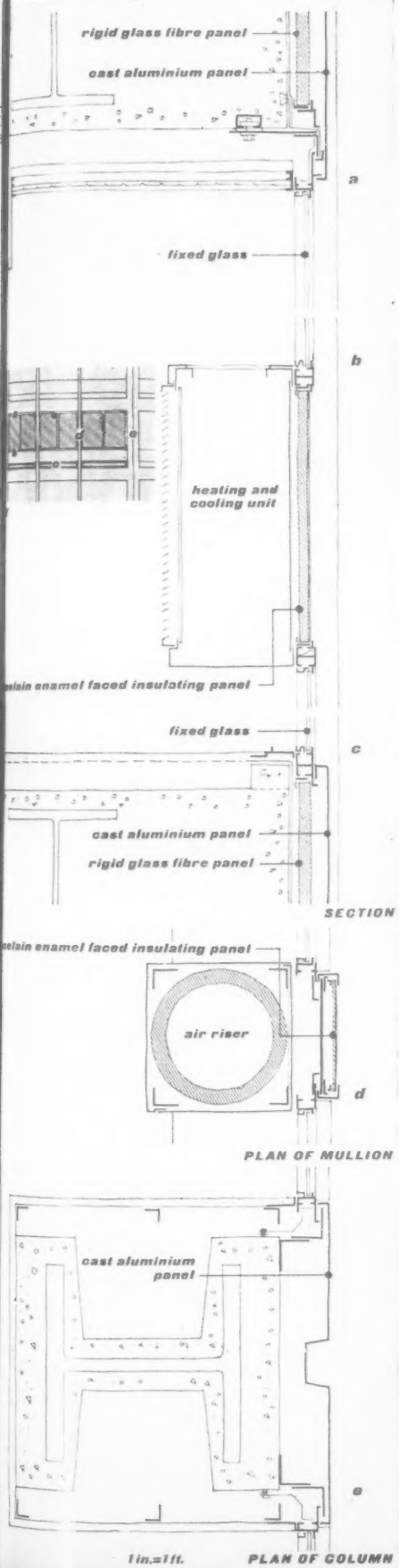
7

Floors	13.
Floor to floor	12 ft. 3in.
Column spacing	27 ft.
Glazing mullions	aluminium.
Facing	
columns and beams	sheet aluminium.
Panel infill	
windows	fixed double glazing.
spandrels	cast aluminium panels—three under each window.
back-up walls	5 in. concrete.

8



shallow relief



MILE HIGH CENTRE, DENVER, COLORADO.
ARCHITECT : I. M. PEI.

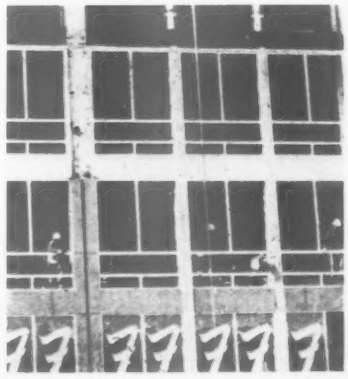
9

A sophisticated and complex wall pattern deriving from the interplay of structural beams and columns (dark tone), horizontal air-conditioning ducts, vertical hollow mullions used as ducts and intervening narrow mullions (all light tone). Here the surface relief is more pronounced than in the Equitable Building opposite, though the effect is still ' curtain-like ', though the ' weave ' is more richly-textured. Where relief of this kind destroys the effect of the wall as a mirror, surface modulation becomes of primary importance.

10

Horizontal ducts seen from inside.

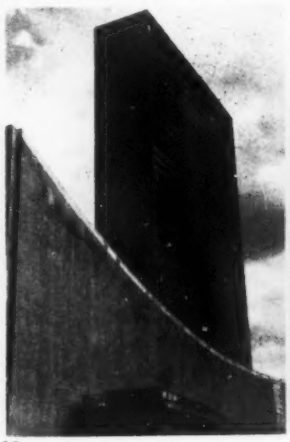
Floors	27.
Floor to floor	12 ft.
Column spacing	25 ft.
Mullion spacing	8 ft. (plus intermediate glazing mullions)
Facing columns and beams	dark-grey cast aluminium panels.
Mullions and transoms	porcelain enamel; colour, bistre.
Panel infill	
windows	fixed glazing, tinted blue.
spandrels	porcelain enamel panels; colour bistre.



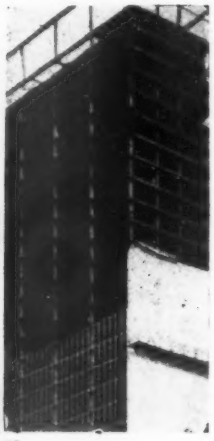
11

sheath walls.....

U.N. SECRETARIAT, NEW YORK. *ARCHITECTS: WALLACE K. HARRISON AND AN INTERNATIONAL BOARD OF DESIGN.*

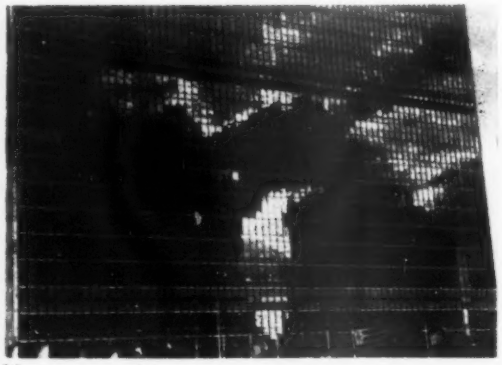


12



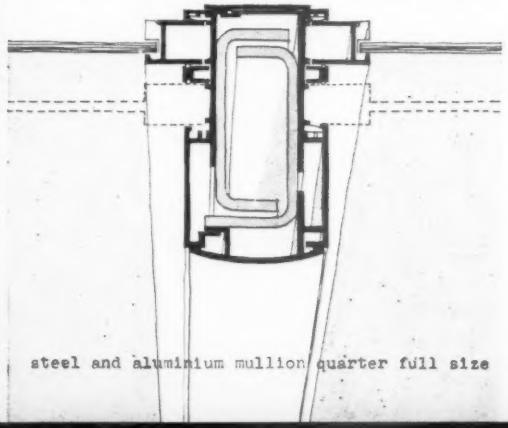
13

The first big-scale curtain wall of the sheath type to be used on a public building. The all-glass structure-free wall holds a 'mirror up to nature' with breath-taking results that are a special contribution of the twentieth century. A glass-roofed building like the Crystal Palace, for instance, did not give this effect because of insufficient contrast between the intensity of light within and without the building. In addition to their qualities as reflectors the UN walls also read as a glass and metal grid (interrupted at intervals by the smaller-scale grid of the service floors), as a light-metal network, and as a filmy, translucent membrane (for the last two see page 309) according to the time of day and the angle of vision.

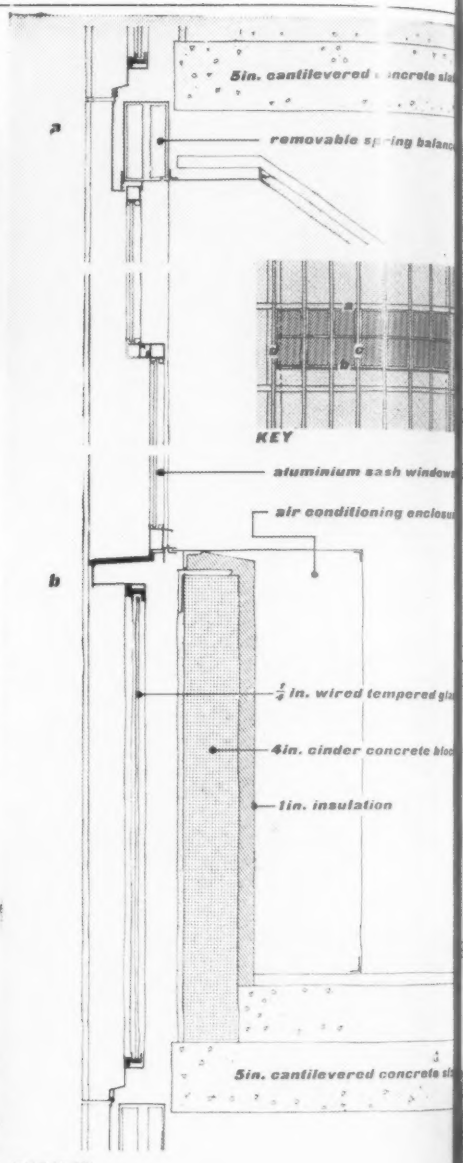


14

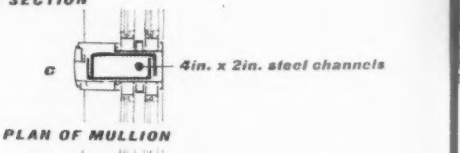
Floors	40.
Floor to floor	12 ft.
Column spacing	28 ft.
Mullion spacing	4 ft.
Mullions and transoms	
sub-frames	steel channels.
cover	extruded aluminium.
Panel infill	
windows	double-hung sashes.
spandrels	¼ in. tempered wire glass.
back-up walls	1 in. asbestos, 4 in. cinder-block.



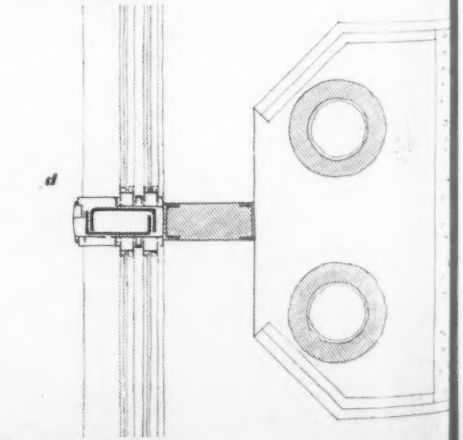
steel and aluminium mullion, quarter full size



SECTION



PLAN OF MULLION



PLAN OF COLUMN

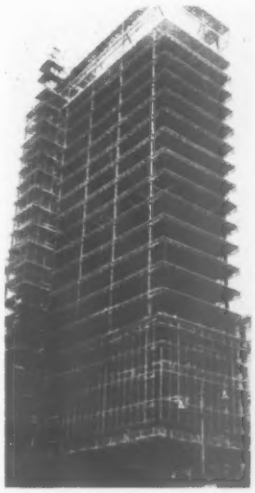
1in.=1ft.

.....all glass

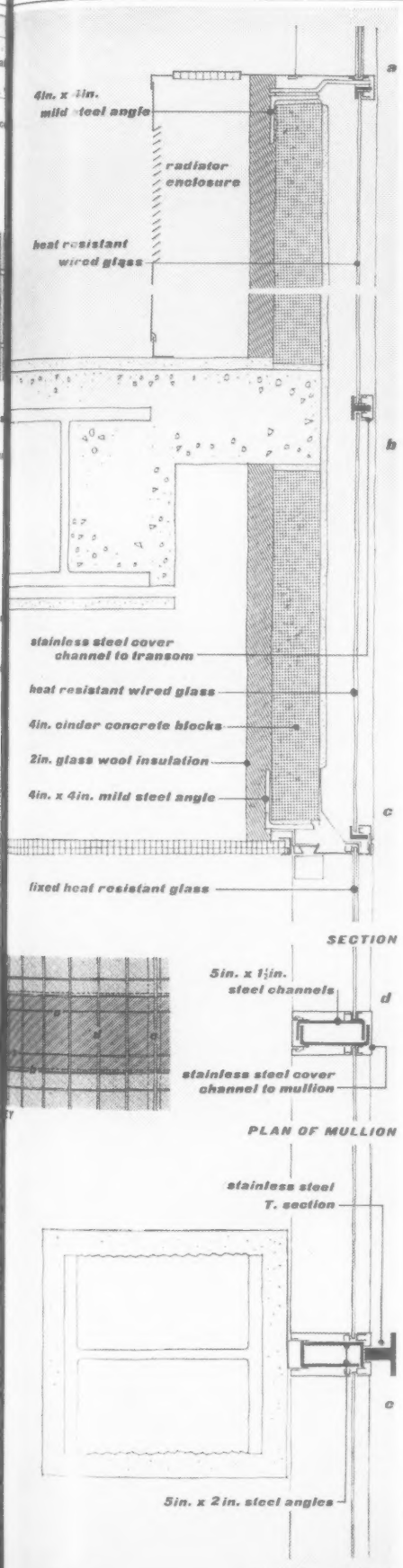
LEVER HOUSE, PARK AVENUE, NEW YORK. *ARCHITECTS: SKIDMORE, OWINGS AND MERRILL: design chief, GORDON BUNSHAFT.*

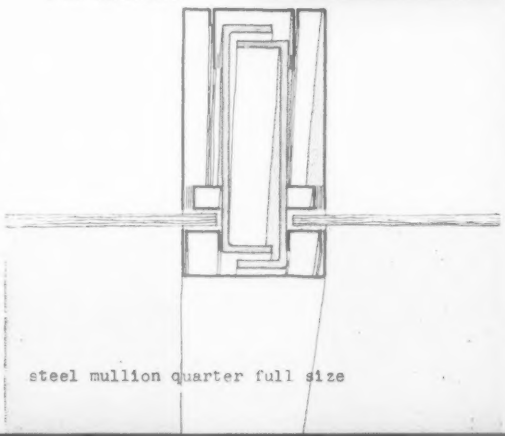
This has been the most influential* and widely-admired curtain wall to date. Its shimmering silver and blue reflecting surface and the extreme simplicity of its form and pattern coupled with its skilfully-handled relationship to a famous thoroughfare (Park Avenue), suggest that it may well come to be considered (to use Dr. Giedion's term) a 'constituent' building of the twentieth century. Both the Lever and the UN building reveal that the æsthetic effect of the curtain wall hangs as much on the profiling of a few inches of metal (see detail below and frontispiece, page 294) as it does on the proportioning of windows and spandrel panels.

*For foreign examples based on the Lever precedent see page 321.



Floors 21.
Floor to floor 12 ft. 6 in.
Column spacing 28 ft.
Mullion spacing 4 ft. 8 in.
Mullions and transoms
sub-frames steel.
cover stainless steel.
Panel infill
windows fixed glazing, single-sheet blue-tinted glass.
spandrels fixed glazing, single-sheet wired glass.
back-up walls
4 in. cinder blocks, 2 in. insulation.





steel mullion quarter full size

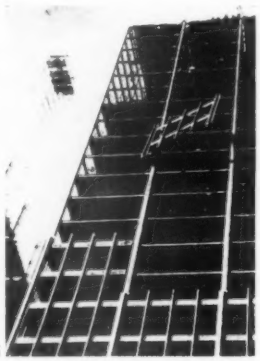
⇦ sheath walls.....

860, LAKE SHORE DRIVE, CHICAGO. *ARCHITECT: MIES VAN DER ROHE.*

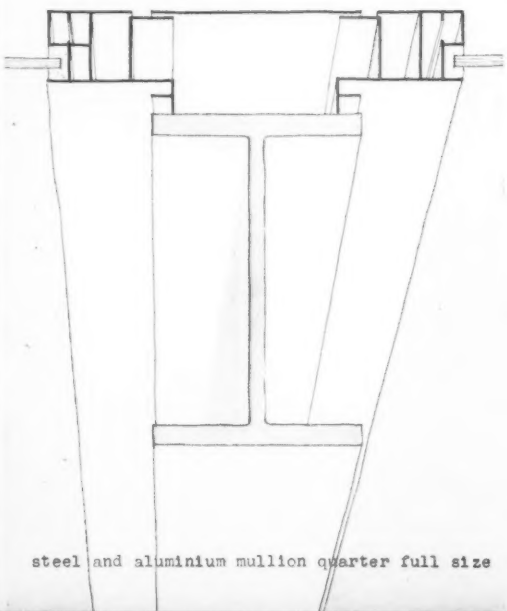
17

A monument by a prophet and the acknowledged master (see pages 338-339) of machine-made architecture. This pair of buildings incorporates more subtleties of modelling, proportion and rhythm than any of the previous examples, which may be one reason why its impact on the public has been less powerful than that of the Lever building. The projecting mullions welded on to the face of steel-clad columns and beams can be considered to bring this wall into the sheath category, though by strict definition it is a grid wall like those shown on pages 310 and 311.

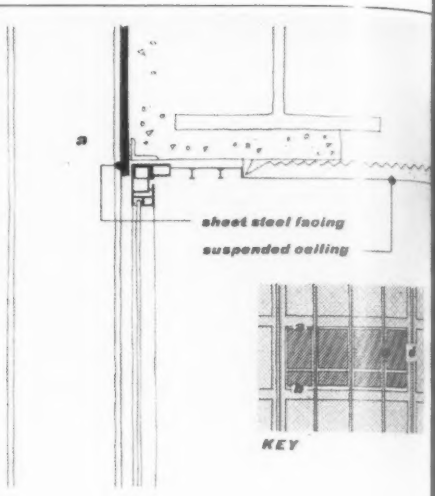
Floors 26.
Floor to floor 10 ft. 6 in.
Column spacing 21 ft.
Mullion spacing 5 ft. 3 in.
Facing materials
columns and beams ¼ in. sheet steel, painted black, with 17 coats of bituminous paint.
Mullions and transoms rolled steel I-sections painted black.
Panel infill
windows fixed, single-glazing.

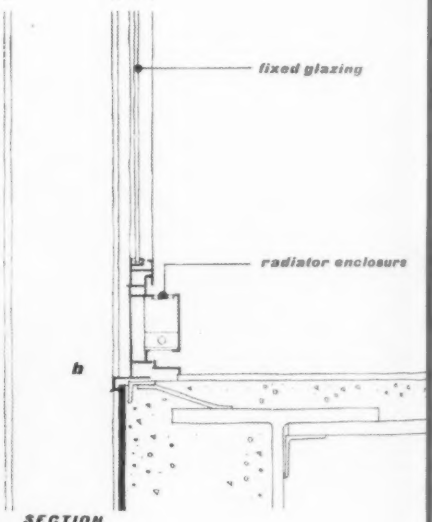


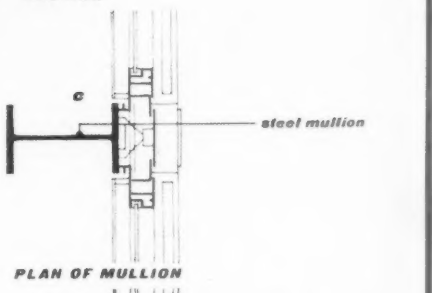
18

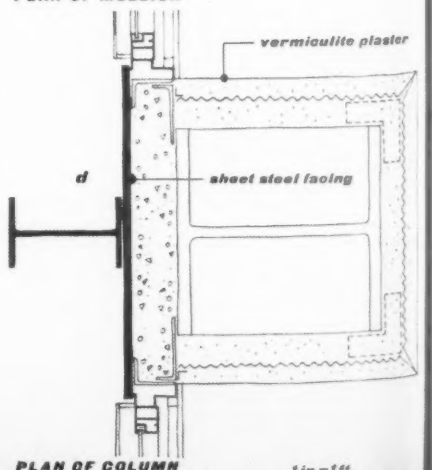


steel and aluminium mullion quarter full size



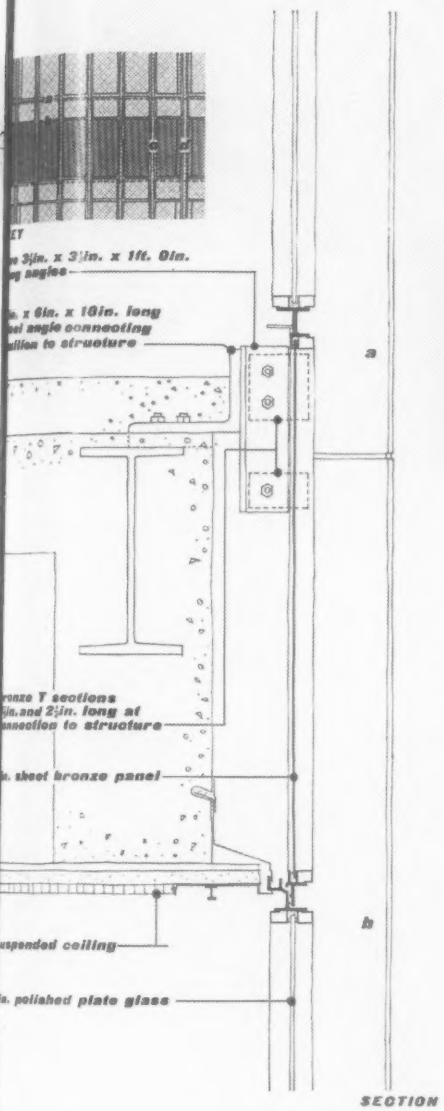






1 in.=1 ft.

.....projecting mullions ⇨



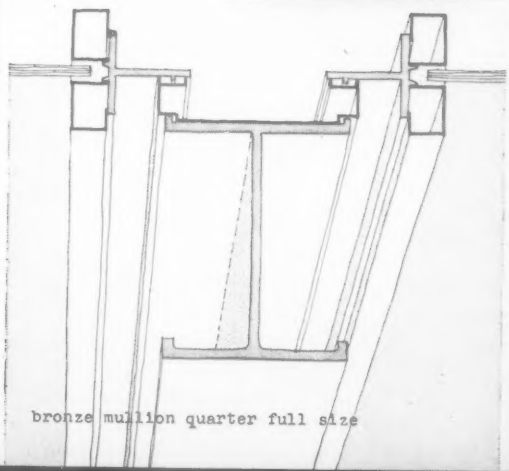
SEAGRAM BUILDING, PARK AVENUE, NEW YORK. *ARCHITECTS: MIES VAN DER ROHE AND PHILIP JOHNSON.*

19

The latest (still uncompleted) major American building to use a curtain wall. But for the grey-tinted glass the whole wall—mullions, window frames and spandrel panels—is of bronze. Like Lake Shore Drive raised mullions, though of smaller section (see detail below), are welded to the surface of the wall. Unlike Lake Shore Drive the structural frame is entirely concealed behind the external envelope. This building has an elaborate system of artificial lighting designed by Richard Kelly (see page 322) to be an integral part of the architectural effect (as well as to provide good conditions for work).

Floors 42.
Floor to floor 12 ft.
Column spacing 27 ft. 9 in.
Mullion spacing 4 ft. 7½ in.
Mullions and transoms extruded bronze
Panel infill
windows fixed glazing: single sheet grey-tinted glass.
spandrels rolled sheet bronze panels.

20



bronze mullion quarter full size

⇦ all-in-one wall.....

GENERAL MOTORS TECHNICAL CENTRE, WARREN, MICHIGAN. *ARCHITECTS: EERO SAARINEN AND ASSOCIATES.*

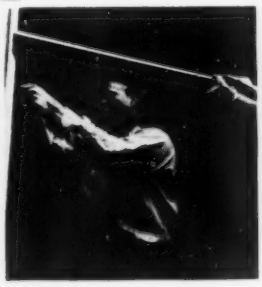
21

This is the only example illustrated here under the heading 'curtain wall classics" that is entirely prefabricated. In most of the urban office buildings (this one is in the country) fire regulations insist on a back-up wall behind the spandrel panel*; here the infill is a (two inch) sandwich panel delivered to the site finished on both sides and ready for assembly; it is also the only example under 'classics' of a low building (three storeys); it has already begun to make its influence felt abroad (see Rodovre Town Hall, Denmark, by Arne Jacobsen, AR, March, 1957, p. 151).

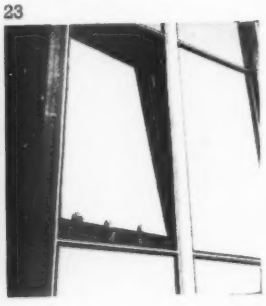
*An exception is the Peachtree-Baker Building, Atlanta, Georgia, by Flatow, Moore, Bryan and Fairburn, page 326.

Floors	3.
Floor to floor	12 ft.
Column spacing	10 ft.
Column facing	sheet aluminium channels.
Mullion spacing	1 per bay.
Mullions and transoms	extruded aluminium sections.
Panel infill	
windows	fixed double glazed.
spandrels	2 in. heat insulating grey porcelain enamel faced.

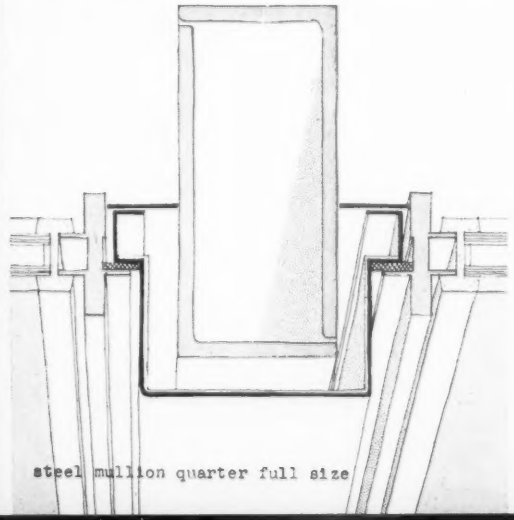
22



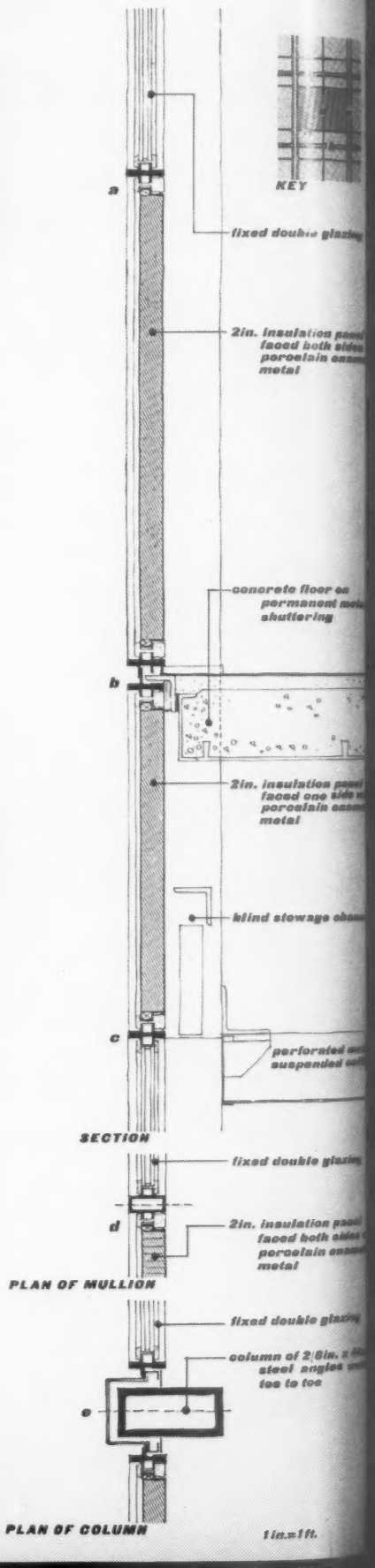
23



Installation of neoprene gasket round glazed panels.



steel mullion quarter full size



continued from page 808]

to distinguish carefully between Architecture and Building. To build—literally, to confirm, is by common understanding to put together and adjust the several pieces of any edifice or receptacle of a considerable size". What Ruskin intended, of course, was to put building (as distinct from architecture) on a lower plane in the hierarchy of things; to distinguish the fine art from the mere piece of engineering, and it was in this distinction that nineteenth-century architecture foundered, and out of a branch of engineering that the modern movement arose. Nevertheless Ruskin's definition of building (once the 'b' is made small) serves very well to describe an important part of the whole architectural endeavour . . . "the putting together and adjusting the several pieces of an edifice". Today this has become a matter of immense complexity involving innumerable specializations, but it is not the architects who are being trained to specialize in them; specialization has not yet been accepted by the majority of architects. They still think of themselves as Architects with Ruskin's capital 'A'. How is it that this nineteenth-century attitude has been able to linger so long into the twentieth century? Largely, I believe, because of the attitude to training.

Nearly all the schools of architecture in the western world still base their training on the renaissance ideal of the complete man and the nineteenth-century ideal of the gentleman architect. Both ideals have admirable and necessary elements in them, but neither are in tune with twentieth-century needs and possibilities. Though a general grounding in the arts and sciences is essential, the education of most architects today is concerned entirely with generalities. That would be fine if those who are not gifted as creative artists were able to undertake post-graduate studies in specialized subjects and if, during their training, some attempt was made to discover their aptitudes for specialization and relate them to estimated needs; this does not happen.[16] It is generally agreed that building technology is making and is likely to continue to make rapid advances. Is it wise, therefore, to train a large number of men as all-round artist-architects, most of whom are not and never can be creative artists, when there is an urgent need for specialists, with a background that combines the scientific approach with experience in design, who can speak to the all-round architect in his own language?[17] There must be many men leading lives of quiet frustration due to the uncomfortable feeling that they have failed to find the right niche, though their training gave them the impression that it would be there at the end, ready-made; whereas, had their skill

continued from page 808]

16. Specialization in building techniques does not cover all the needs. THE ARCHITECTURAL REVIEW has pleaded many times for architects trained to specialize, for instance, in the art of town design—a complicated matter of visual co-ordination for which no adequate courses exist. In addition there are the various branches of town planning as well as building research and even journalism.

17. 'For good or for evil specialism is the order of the times. We employ a specialist to operate upon us for appendicitis just as naturally as we employ a specialist to build a racing yacht or a suit of court clothes. This being so, it becomes necessary to consider also specialism in art, and in particular in architecture. How far, that is to say, can a single man plan and carry out all the details of a modern building? At what point must the recognized axioms about the division of labour come into force if the building is to be carried through to its best possible completion. America, at any rate, seems to have decided in favour of the specialist . . . Americans, however, are not infallible, and the question is still open to discussion.'

THE ARCHITECTURAL REVIEW, pages 258–259, June, 1905, Volume XVII, No. 108.

18. *Charles Eames* and his wife, Ray, were studying architecture at Cranbrook Academy of Art, Michigan, when in 1945, in collaboration with Eero Saarinen, they started investigating the applications of new techniques (some of them developed by motor engineers in nearby Detroit) to furniture. The result has set the form for, up till now, *the* twentieth century chair. *Richard Kelly* is a Yale-trained architect with earlier training in illuminating engineering who became a specialist lighting consultant; he has worked with numerous architects—the best known collaboration being with Philip Johnson, out of which have come new concepts of lighting so much a part of the building that they can, without exaggeration, be called new concepts of architecture. *Robert B. Newman* is Vice-President of Bolt, Beranek and Newman Inc., a firm of acoustical consultants in Cambridge, Mass. Newman has a B.A. and an M.A. in Physics from the University of Texas, and a Master Degree in Architecture from M.I.T., where he is an assistant professor. The firm works closely with architects on the scientific and aesthetic aspects of acoustics; they were acoustic consultants for the United Nations Headquarters.

19. 'More than 80 per cent of all US buildings are being built without an architect.

'Average income of the architect is less than a bricklayer in the east.'

Gropius Appraises Today's Architect, Architectural Forum, New York, May, 1952.

20. '. . . it has become generally recognized in recent years that the cost of buildings, in terms of human effort, has not been reduced

been developed as organizers, lighting, acoustical, engineering experts and so on, much pent-up energy and ingenuity might have been released. It is a matter of happy accident if an Eames gets together with chairs, a Kelly with lights or a Newman with acoustics,[18] and what a contribution an architectural background can make when this happens!

It is not possible to do more than broach this subject here, since the information on which further suggestions could be made, doesn't exist. It is clear only that architects are not adequately fulfilling all the functions demanded of them. We are surrounded by architect-designed buildings that give aesthetic satisfaction to no one, that are often too cold or too hot, too noisy, too leaky, too inflexible and much too expensive. It is little wonder that architects are responsible for only a minor proportion of all the building carried out.[19] People cannot help noticing that something somewhere doesn't add up. What doesn't add up are the kind of things they are beginning to take for granted like cars,[20] television sets, refrigerators and washing machines, when set beside their buildings. They have heard, because architects, among others, have never stopped telling them, of the great advantages to be gained from prefabrication, standardization, modular planning and so on; but architecture, it seems, still fails to benefit. All the arguments of the architects and builders as to why architecture cannot compete don't quite avail against such standing comparisons as the refrigerator and the washing machine.[21] Indeed, at a price, architecture nearly can compete in finish, glitter and efficiency, but at what a price! And lowering of costs with the perfecting of techniques is something the public has been led to expect from efficient industrialization. It is often suggested that the responsibility for this state of affairs rests more with the building industry than with the architect, who is not in a position sufficiently to influence this conservative mammoth. Certainly the drag of time-honoured methods on builders is a powerful one but so, to be honest, is it with architects too.

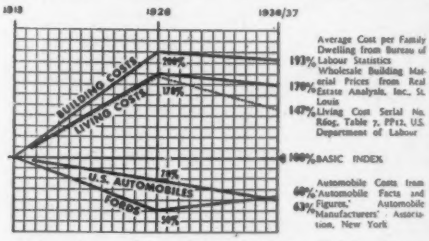
Now that both of them have caught the popular imagination with the curtain wall the benefits of rational prefabrication and perhaps even mass-production may not be far away.[22] If mass-production is to come, it is of vital importance that the elements produced should be as good in design as well as performance as we can possibly make them. However, due to the absence of specialists among architects who can speak to the engineers in their own language and conversely of engineers who can speak to architects in their own language, the best in design

[*continued on page 321*

at anything like the rate of reduction in cost of food, clothing, toys, and adult luxuries . . . Meeting increased space requirements is straining our capacity, but, if we add to that the increased quality and reduction in cost and construction time which we have learned to demand, new building units and production methods must be devised.'

Edward X. Tuttle, Vice-President, Giffels and Vallet, Inc., speaking at the B.R.I. 1955 Conference referred to (in 8) above.

'In 1928, I found in the U.S.A. a most illuminating diagram, roughly comparing the trend of prices for building and for automobiles between 1913 and 1926. It shows the remarkable fact that within the same period the average costs of building increased the price in accordance with the increasing labour costs. Refinement of mass production methods, on the other hand, considerably lowered the price of automobiles. A decent dwelling became unattainable for the low-income class, yet the car became an everyman's tool. The up-to-date completion of the diagram (to



1936 when this was written. Ed.) shows that the price of the average car has steadily declined, whereas the cost of the average dwelling has been only slightly lowered since 1926. This diagram reveals that our building methods, being far behind the times, are not yet fit to solve the problem.'

From *Scope of Total Architecture* by Walter Gropius. George Allen & Unwin, London, 1956.

21. Some consider it unfair to make comparisons between industries that produce goods like refrigerators and those that produce components for buildings; certainly there are basic differences between them. It is unlikely, for instance, that building can ever be an all-dry technique, nor is it likely that large buildings will be entirely prefabricated. Nevertheless, the tendency towards dry-construction and shop-assembly with the varying degrees of standardization, mass-production and modular co-ordination that follow, has already brought benefits to building and is often the result of experience gained from a study of the consumer goods industries; it is very probable these still have much to teach us.

22. 'Although some architects maintain that stock sizes cannot adequately meet varying needs of different building types. . . . Opinions [*from a questionnaire investigating the demand for stock exterior metal building panels sent to* 711 *architects*] indicate most needed panel would be a 4 ft. by 8 ft. module

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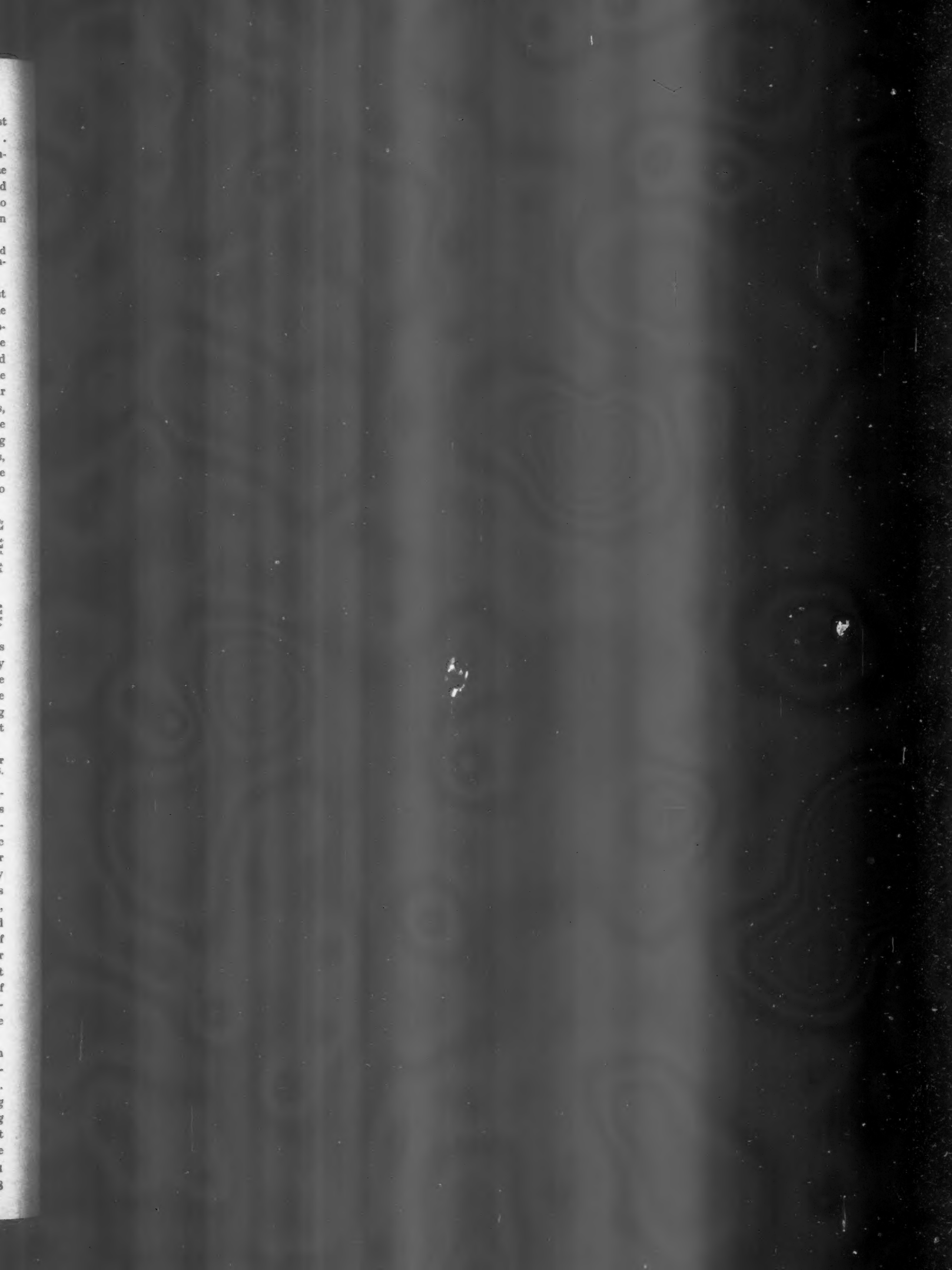
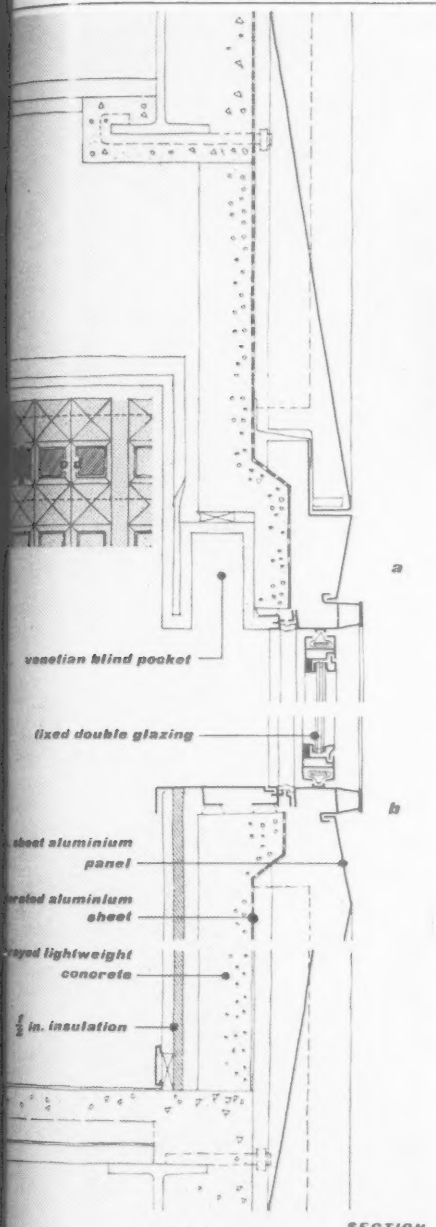


.....aluminium wall



ALCOA BUILDING, PITTSBURGH, PENNSYLVANIA. *ARCHITECTS: HARRISON AND ABRAMOVITZ.*


24


25

The æsthetic effect of thin-gauge metal prefabricated in floor-to-ceiling units and with concealed horizontal and vertical joints, is radically different from the previous examples, which all employ one form or another of exposed sub-frame, with panels inserted into it either on-site or off. The Alcoa building is an aluminium envelope, and it shows very clearly the fresh set of problems that such a system raises; with virtually no trabeation, with vertical structural members encased in a slightly V-projecting sheath, with spandrel panels having a dished indent for stiffness and with the rounded corners of the pneumatically-sealed windows, the whole effect is to blur and 'soft-focus' the precision-made look which has been one of the chief qualities of the curtain wall. The kind of pattern-making that the use of thin-gauge metal invites, opens up pitfalls for the designer that it is going to take all his skill to avoid, and a great deal more than skill to exploit.

Floors	31.
Floor to floor	12 ft.
Column spacing	c. 20 ft.
Facing materials	columns faced with aluminium sheet. Prefabricated concave panels of pressed $\frac{1}{8}$ in. aluminium sheet—bolted to metal angles connecting to structure, complete with double-glazed windows fixed except for cleaning.
Back-up walls	$1\frac{1}{2}$ in. cavity, 4 in. perlite 'blown-on' concrete on expanded aluminium.


26

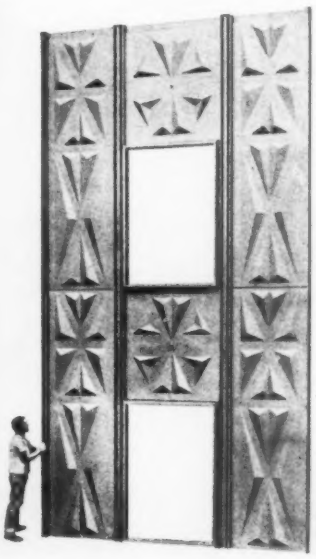
steel wall.....

SOCONY MOBIL BUILDING, NEW YORK.
ARCHITECTS: HARRISON AND ABRAMOVITZ.

27

A further use of thin-gauge metal (stainless steel) in large prefabricated panels (see below). This time the pattern is raised not only for stiffness but also to cut down glare. The effect of the pattern, when seen from a distance, coupled with the absence of a sharply-profiled sub-frame, again gives a 'soft-focus' effect (see preceding page); here, the wall texture and the spacing of the square-cornered windows are reminiscent of the masonry-clad skyscraper of the past, though, in technique, the metal sheath walls with solid back-up relate to the industrial buildings which were the precursors of the contemporary curtain wall.

Floors	42.
Floor to floor	12 ft.
Column spacing	20 ft.-25 ft.
Facing materials	prefabricated 20 SWG stainless steel pressed panels with fixed single glazed windows.
Back-up walls	floor to floor 4 in. cinder concrete, 1 in. insulation.



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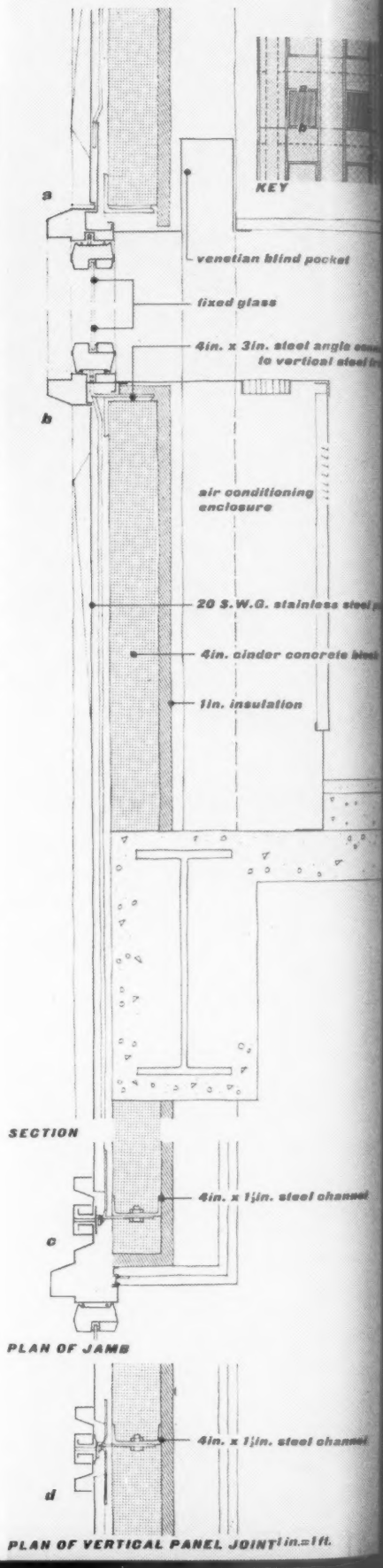

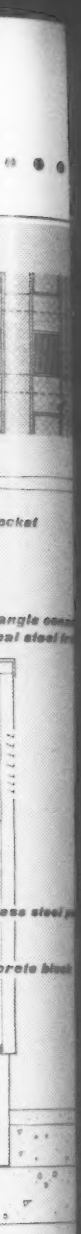

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with additional sizes to satisfy more specific needs.'

From a survey conducted by the research advisory service of the American Institute of Architects, A.I.A. Bulletin, July-August, 1955.

23. The A.I.A. survey of architects' opinions carried out in 1954 and published in 1955 (see 22) was paralleled by a survey of building owners and building contractors conducted by the Building Research Advisory Board, reported at the Metal Curtain Wall conference held in 1955 (see 8). This conference and the surveys taken together with the 1956 Workshop Conference (see 1) and the Princeton report of Stainless Steel curtain walls (see also 1) have aired very usefully opinions of manufacturers, architects and clients on the curtain wall problem and possibilities. So far there have been no similar surveys or conferences in England, but the Building Research Station has made its own study, which will shortly be published as two Building Research Digests under the title *Light Cladding*.

24. 'Pliny the younger (Ep. 39 to Mustius) proposing to repair and enlarge by the addition of a portico, an old Temple of Ceres, that stood upon his estate in Tuscany, directs his architect immediately to buy four marble columns of any sort he pleased. By this method of purchasing, at any time, columns of all orders and proportions, ready formed at the quarries, as goods in a shop, or warehouse, the ancients had an advantage of erecting porticoes . . . of any grandeur or extent, in a very short time.'

Sir Christopher Wren: "*Tract on Architecture III.*"

25. 'It is believed that one of the most important things to be done for walls at the present time is to develop testing procedures that are realistic and can be standardized. These are essential to assure the designers, the construction industry, and the financing or underwriting agencies that the building will have the full life for which it is designed, without excessive maintenance.'

Elmer R. Queer, Director and Professor of Engineering Research, The Pennsylvania State University, speaking at the conference referred to (in 8) above.

26. 'It is ridiculous to accept without complaint that today it takes 9 months to a year to create a substantial building, with its hundreds of drawings for plans and details. The span of 2 to 2½ years from conception to execution is too much of one's life to devote to one building. If we can discover how to shorten that substantially it will give us all an opportunity to do more exciting things and provide more shelter for all. Perhaps then some of us could more easily solve the greater problems of our country and build or rebuild more rapidly to make life in our cities, towns, suburbs and rural areas more comfortable and joyful.'

Max Abramovitz (Harrison and Abramovitz) speaking at the conference referred to (in 8).

continued from page 318]

may be hard to get and even harder to agree upon. Fortunately there are signs of the two getting together and making a start.[23]

Arguments are being raised again, as they have been through the years, that prefabrication, standardization and mass-production will lead to unending monotony and the levelling down of the man-made environment. The only answer to this is to ask ourselves if we are really proud of the environment we have created without such methods? Do we, for instance, consider it preferable to the standardized urban environment of the eighteenth century? To the further argument that such methods are putting architectural invention into a strait-jacket, one can point out, again, that eighteenth-century standardization did not have this effect on the creative architects of the time, and is unlikely to have on those of our, or any other, time.[24] The difference is that in our day those who are not gifted with creative originality have, for some of the reasons given above, been persuaded to attempt the impossible—with disastrous results, while in the eighteenth century their equivalents were happy to have well-designed pieces to 'put together and adjust'.

Standardization in our day will bring benefits immeasurably greater than it did to the eighteenth century. Quite apart from savings to client and builder, in cost and time, it could free numbers of architects from the necessity for each to make of his office a separate research organization and filing bureau. When some agreement is reached on standards, and when materials and components are tested by agreed methods and the results made freely available,[25] much of the experimental aspect of the architect's job, wasteful both to his client and himself, will be over.[26] The whole process should, of course, be subject to constant study and improvement; but this should be the job of the architect-engineer, specializing in such matters, in close contact with what the creative thinkers are doing and with the factory. The organizing-architect who makes use of the new standards will be able to devote himself more thoroughly to carrying the job through efficiently and on time, an aspect of architecture about which the client feels particularly keenly. Estimates of cost will be more easily and accurately made and variations during building progress less likely.

None of this can be fully efficient while we still lack agreement on measurements. Until there is an extensive use of modular co-ordination by manufacturers of building components, arrived at through consultation with architects, most of the advantages that modern methods of building can bring to us all will go by default.

Much of the internal equipment of the building sheathed with curtain walls is standardized also (some mass-produced); but, as yet, without any relationship in scale, proportion, colour and detail to the other, particularly the external, standard parts. It would seem to be self-evident that an architecture based on such principles should carry a modular relationship consistently through doors, windows, walls, floors, ceilings, services, built-in furniture and equipment. Not only would this provide a unifying factor in a variety of shapes, colours, textures and patterns that at present borders on anarchy, but it would bring with it economic advantages that are too obvious to need describing. This is beginning to be more generally realized and both in Europe and America extensive research has been carried out in recent years; thirteen countries are now taking part in a two-year construction programme in which a number of experimental buildings will be used to test the principles laid down in the European Productivity Agency's report on the subject.[27]

There can be nothing set and inflexible about the application of modern industrial methods to rectilinear systems of building. Apart from improvements and discoveries which will certainly be made, research is already under way into the problems of mass-producing moulded plastic buildings, and success in this could have a profound effect on all branches of building.[28] It is unlikely, however, that such materials and methods will replace present systems of rectilinear construction, particularly for multi-storey structures. Nevertheless, one can look to moulded systems, which include reinforced concrete poured or sprayed, to provide foils to the rectilinear backdrop, and expect them also to be used in close conjunction to, or within, the framework.[29]

The paraphernalia of urban existence has proliferated to such an extent in recent years that it is often impossible to see the building for the advertisement, the advertisement for the sign, the sign for the traffic, the traffic for the speed. The curtain wall will not solve all of this, but it can help. A diagrammatic backdrop instead of a series of competing scenes could provide a frame of reference. The sense of orderliness it imparted might even encourage those responsible to do something about the rest of the mess. Not that everything should be regulated and standardized, quite the contrary. The point of having the backdrop is for it to be just that; a background to a drama. The very essence of the dramatic lies in the unexpected; people provide part of that, but so also do the signs of their existence and the marks they make. They make a mess now, but that is no reason why they should always make a mess, or at least not a dirty one. Ex-

[*continued on page 335*

27. This—Phase II—of E.P.A.'s work on modular co-ordination was reported by Bruce Martin at a meeting of the Modular Society at the Royal Society of Arts, October 15, 1956. *Modular Quarterly*, Autumn, 1956.

28. An example of recent research into the possible uses of plastics in building is the Monsanto House; a research project sponsored by the chemical company of the same name and carried out at M.I.T. The house is designed to a moulded module 8 ft. by 16 ft. bent to form ceiling, walls and floor. The model shown

here comprises eight modules cantilevered in pairs from a central utility core to form four 16 ft. square rooms.

29. Below are three illustrations of moulded forms of the kind which provide, or might be used to provide, a foil to the rectilinear grid of curtain walls:

A house designed by John McL. Johansen for the Atlas Cement Co. The structure is concrete sprayed on to an armature of steel pipe, rod and fabric.

The reinforced concrete roof structure on the fourteen-storey block at Golden Lane, City of London, by Chamberlin, Powell & Bon.

[*continued on page 335*

CURTAIN WALLS: TOWARDS A VERNACULAR

The standardization of the external envelope in the form of curtain walls is beginning to bring a degree of order to much that, since the breakdown of architectural discipline in the romantic movement, has been merely chaotic. At present, this standardization is piecemeal, experimental and sometimes ill-considered in design, but, as the following pages show, its acceptance in America is beginning to give promise that a vernacular of modern architecture may be developing. Far from the results proving monotonous, there is surprising, and somewhat excessive, visual variety. This may well calm down as production increases and the system is rationalized: the present period may then be considered as merely a first stage in which prototypes were produced and studied on their merits, and when variants were evolved for different types of buildings. From this brief American survey it would seem that there are few types of building considered unsuitable for enveloping with one form or another of curtain wall.

offices

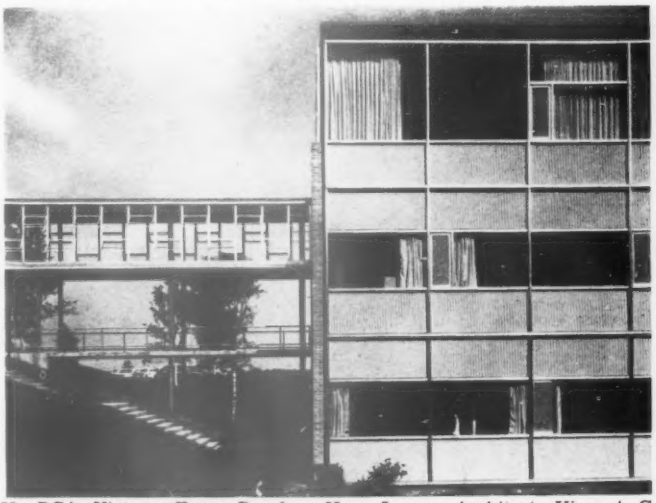
29, Enterprise Building, Tulsa, Oklahoma, with infill of glass and porcelain enamel panels. Architect, Walter Aschlager; completed 1955.


DALLAS FEDERAL SAVINGS


Like
Sales
LOANS
INSURANCE
Sunny
Brook

30 and 31, two buildings typical of many now being faced with standard curtain walls; 30, in Chestnut Street, Philadelphia, and 31, an office building on the outskirts of Denver, Colorado. 32, offices with a bank on the ground floor, in Dallas, Texas; the porcelain enamel panels are in two colours, the flat ones blue and the embossed grey. Architect, George L. Dahl. 33 and 34, the Tishman building, Wilshire Boulevard, Los Angeles. Architects, Victor Gruen and Associates. 33 shows the horizontal fixed aluminium sun-shades (north and south façades) and the adjustable vertical louvres (east and west), shown in detail in 34.

offices in the country



35, RCA Victor offices, Camden, New Jersey. Architect, Vincent G. Kling; sandwich panels faced with yellow corrugated porcelain enamel in a stainless steel frame.

36, offices under construction for the Monsanto Company, St. Louis County, Missouri. Architect, Vincent G. Kling; sandwich panels with a corrugated porcelain enamel external surface, foam glass insulation and stainless steel inner surface will be set in stainless steel frames.

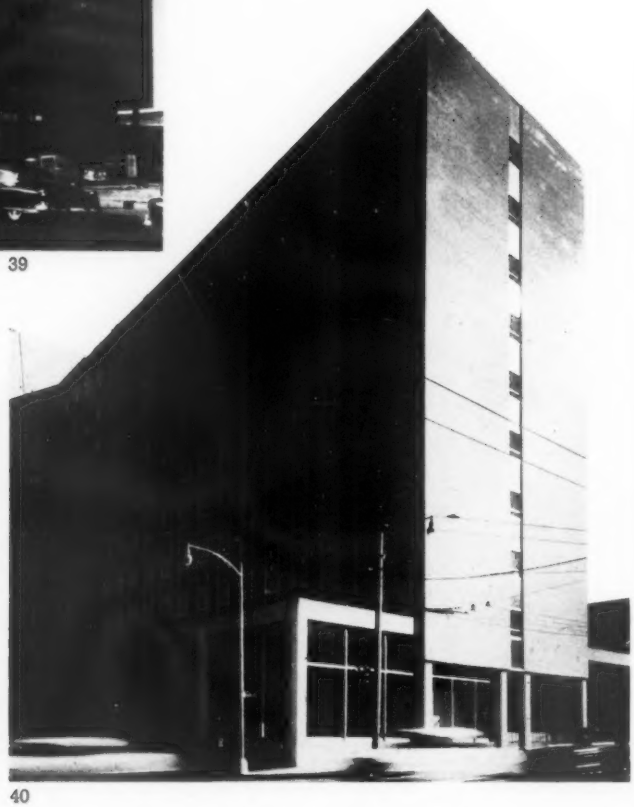
37, Wyeth Laboratories, Radnor, Pennsylvania. Architects, Skidmore, Owings and Merrill; green porcelain enamel panels in steel frames.

38, Ford Motor Co. offices, Dearborn, Michigan. Architects, Skidmore, Owings and Merrill; blue-green porcelain enamel honeycomb panels in a stainless steel frame.

offices

39. Simms Building, Albuquerque, New Mexico. Architects, Flatow, Moore, Bryan and Fairburn; porcelain enamel panels in an anodized aluminium frame. 40, Peachtree-Baker Building, Atlanta (part of a larger scheme), Georgia. Architects, Alexander and Rothschild; porcelain enamel panels are here used for the first time in the south-east of the US without back-up walls. 41, Redding-Miller Building, Denver, Colorado. Architect, T. J. Moore, Jnr.; multi-coloured porcelain enamel panels in an aluminium frame. Projects by three of the largest architectural firms in the US: 42, CIT Building, New York City. Architects, Harrison and Abramovitz; polished black granite in a stainless steel frame. 43, Texaco Building, Los Angeles. Architects, Welton Becket and Associates. 44, offices nearing completion for Inland Steel, Chicago. Architects, Skidmore, Owings and Merrill; stainless steel and glass, with structural columns outside curtain wall.

39



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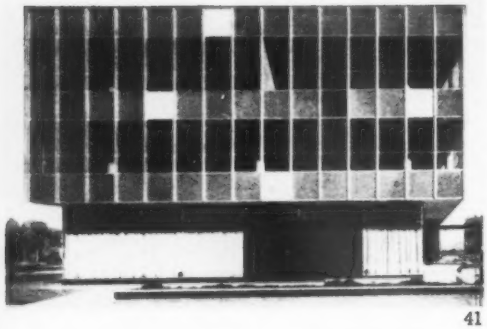

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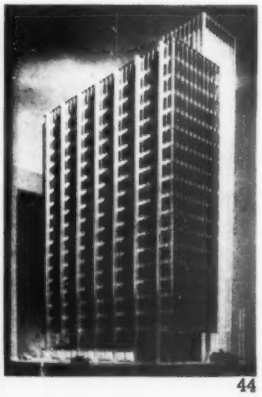


44

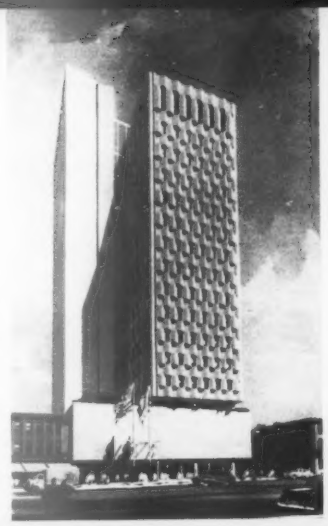
banks

45

46

47

45, First Security Bank, Salt Lake City, Utah. Architects, W. Sarmiento; H. S. Mayer; S. W. Winburn: rust-red porcelain enamel panels in an aluminium frame. 46, Standard Federal Savings and Loan Building, Los Angeles. Architects, Welton Becket and Associates, and 47, City National Bank, Beverly Hills, California, by the same architects; panels are mosaic-faced and sun-breakers tie into the metal frame over the windows. 48, proposed Chase Manhattan Bank, New York City. Architects, Skidmore, Owings and Merrill; stainless steel and glass with the structural columns outside the curtain wall (see also 44). 49, Republic National Bank, Dallas, Texas. Architects, Harrison and Abramovitz; embossed, square aluminium panels. 50, Wachovia Bank and Trust Co., Charlotte North Carolina. Architects, Harrison and Abramovitz; prismatic-shaped, precast, coloured concrete panels.



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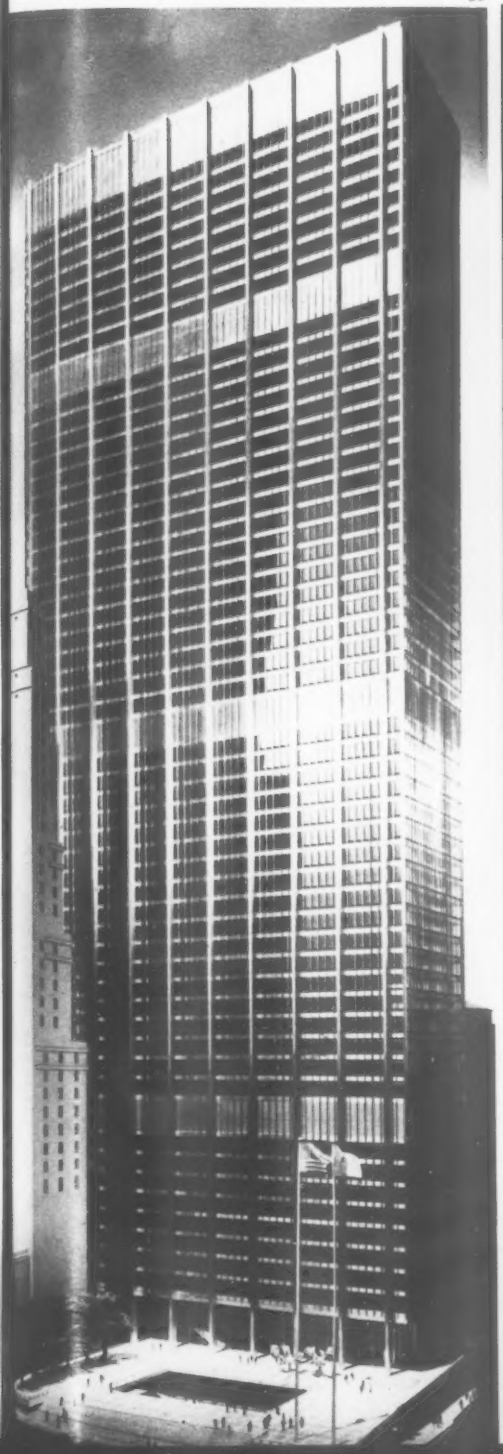

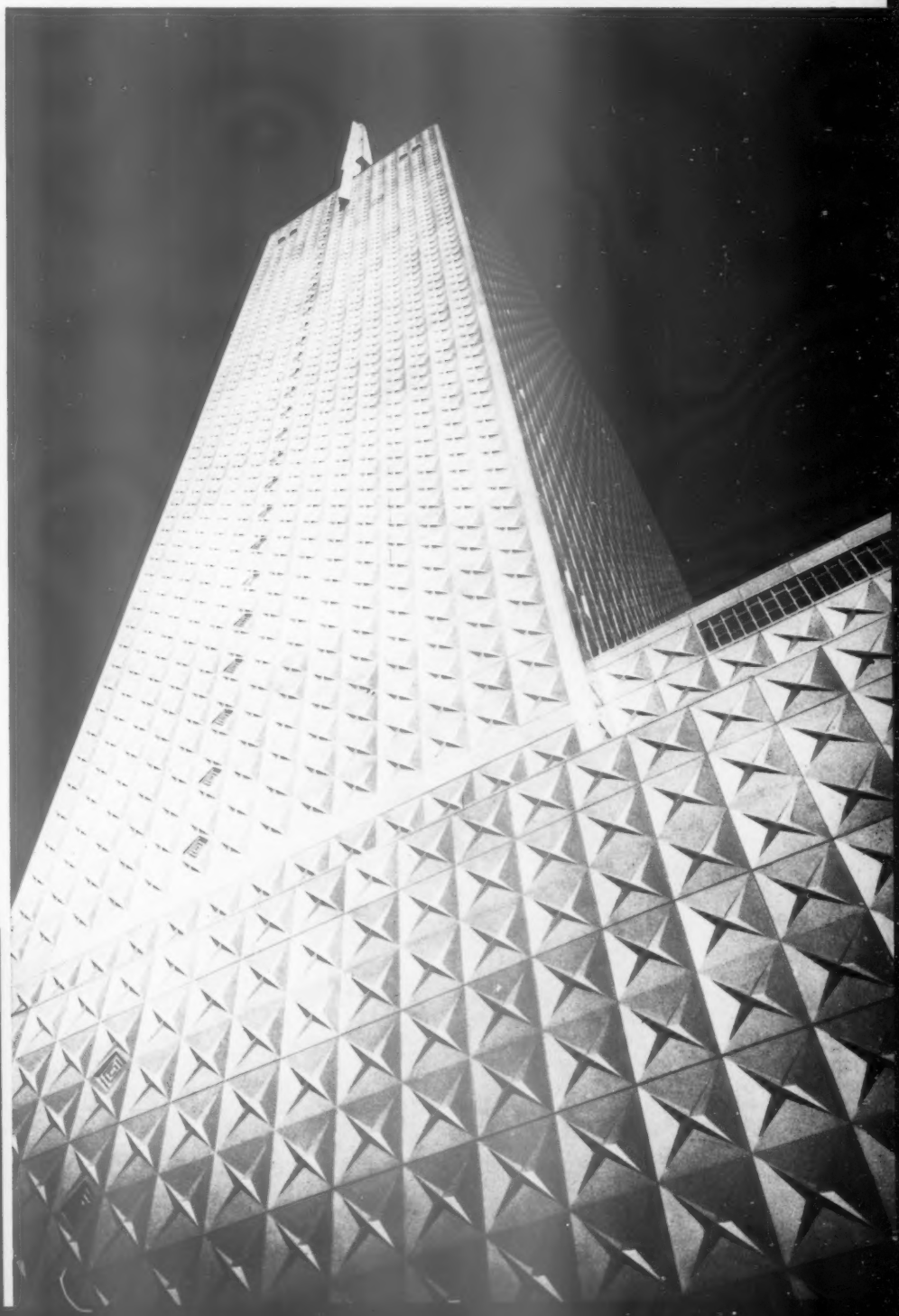

schools

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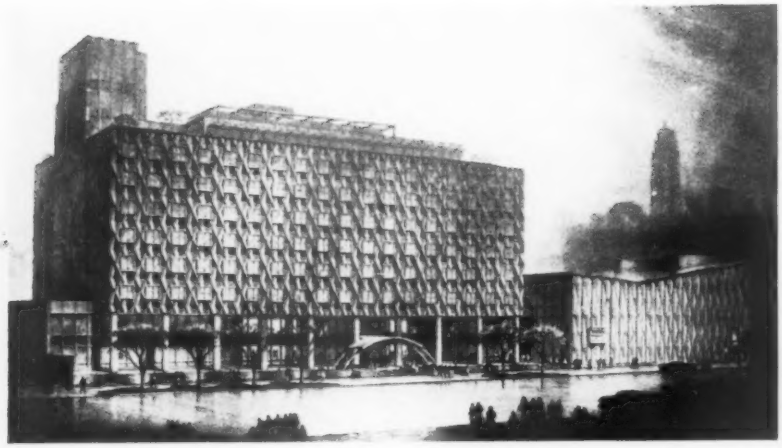

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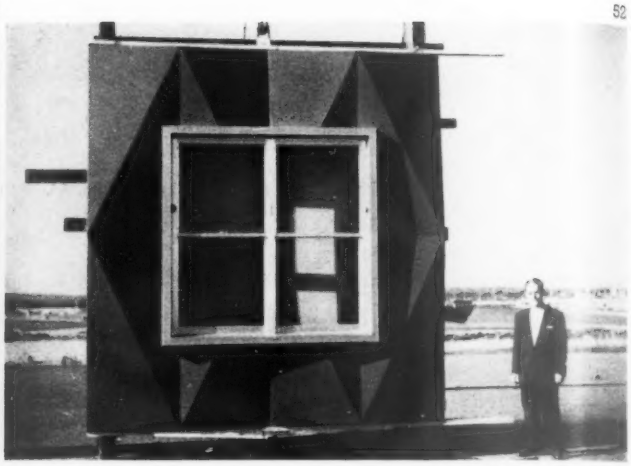

51, proposed Fashion Institute of Technology (providing accommodation for 1,250 full-time and 3,000 part-time students, with laboratories, auditorium, gymnasium and library), New York City. Architects, de Young, Moscowitz and Rosenberg; 52, test panel for the building's external sheath of blue, patterned aluminium; the window frame is gold-coloured metal alloy.

53

54

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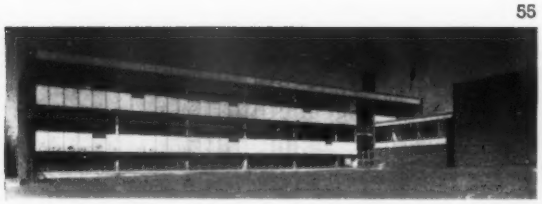


56

55, Douglas Elementary School, Kansas City. Architects, Kivett, Myers and McCallum; panels are yellow, porcelain enamel. 56, North Penn Senior High School, Lansdale, Pennsylvania. Architects, H. L. Shay and Associates.

58, 59

58 and 59, the Phyllis Wheatley Junior School, New Orleans. Architects, Colbert and Lowrey; the porcelain enamel panels were made by a local stove-enamel firm and are blue and white in 58; magenta and white in 59.

53, 54 and 57, two schools employing the same type of steel and glass curtain wall. 53, Keokuk High School, Idaho. Architects, Perkins and Will; the mullions project 6 in. from the glazing and are painted red; frames to window openings are yellow. 54 and 57, Kellogg High School, Idaho, by the same architects in association with Culler, Gale, Martell and Norrie; mullions here are painted yellow.

57

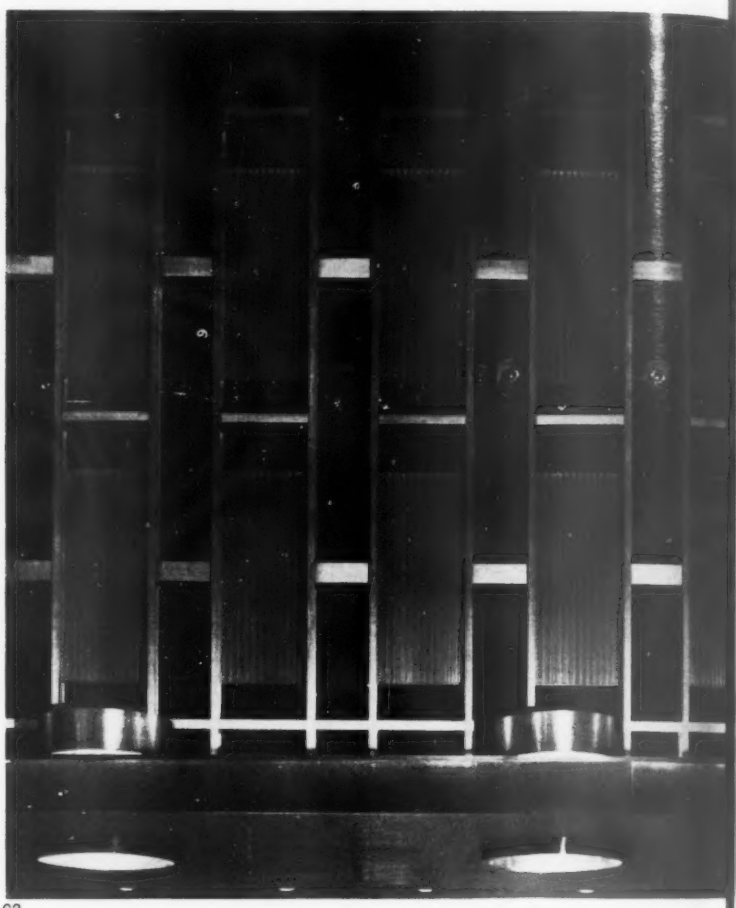
60

60. external facing of galvanized and painted steel at the Weirton Steel Co., Weirton, West Virginia. 61, Chicago Workshop for the Blind, Chicago, Illinois. Architects, Shaw,

61

Metz and Dolio. 62, building for Lockheed Aircraft, Burbank, California. Architects, Welton Becket and Associates; walls above ground level of glass and corrugated aluminium.

62

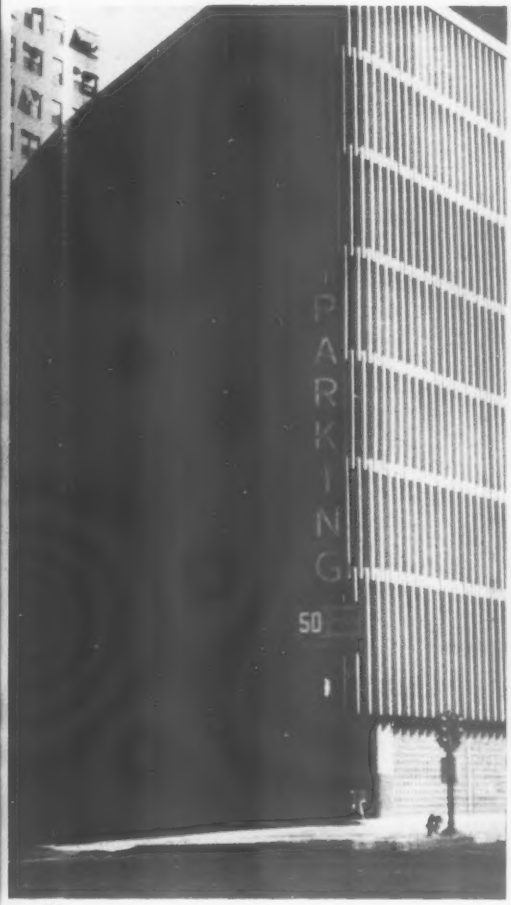


63

68

and laboratories

63, multi-level car park, Medical Towers (see also 70, page 332). Houston, Texas. Architects, Goleman and Rolfe, in association with Skidmore, Owings and Merrill; the aluminium frame and panel walls serve as a buffer for, and, partially, to screen, the cars. 64, Chicago garage with screen of precast concrete fins. 65, garage at Salt Lake City, Utah, with walls of vertical steel rods. 66 and 67, garage in Chicago by Shaw, Metz and Dolio. The wall consists entirely of



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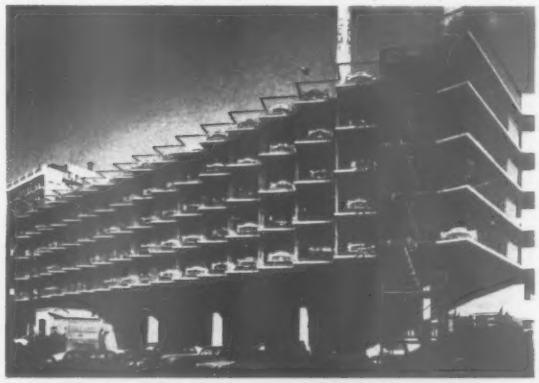

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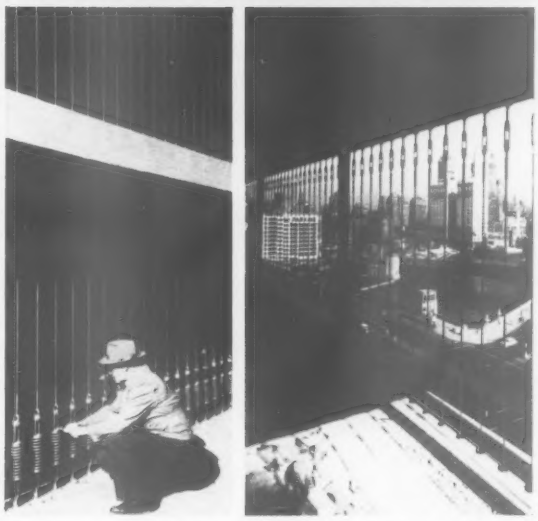
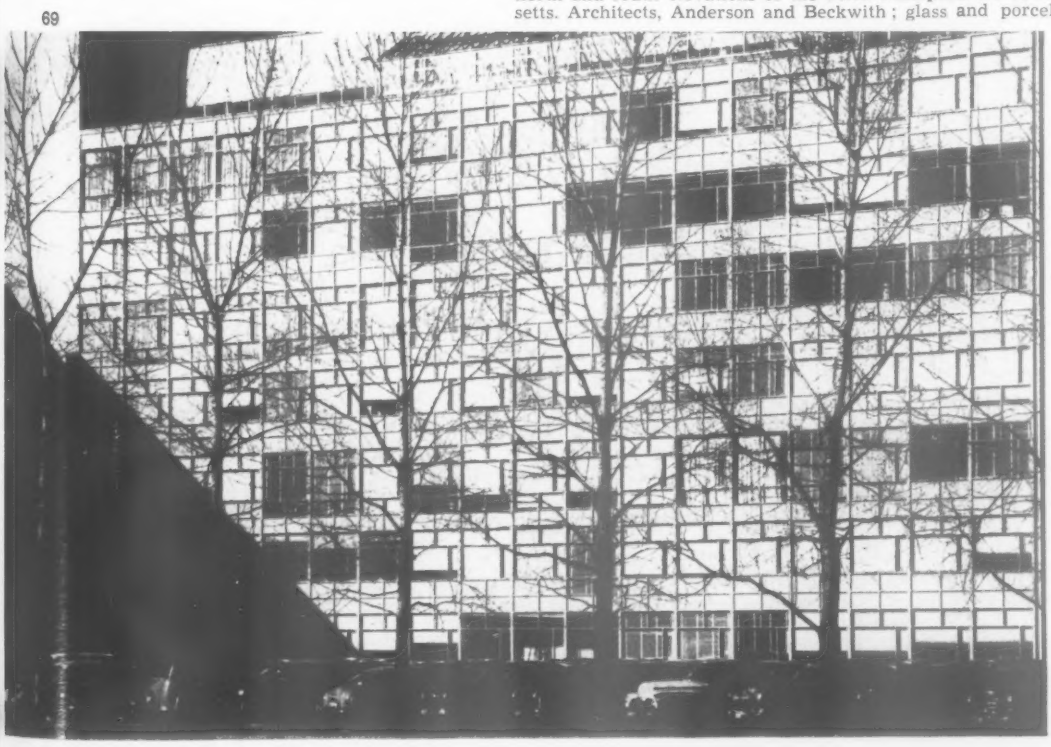


66, 67

stainless steel wires ¾ in. It is estimated they would stop a car travelling at 40 m.p.h. 68 and 69, north and south elevations of the John Thompson Dorrance Laboratories, Cambridge, Massachusetts. Architects, Anderson and Beckwith; glass and porcelain enamel panels in a steel frame.

69



70

71

70, Medical Towers, Houston, Texas (see also 63, page 330). Architects, Goleman and Rolfe, in association with Skidmore, Owings and Merrill; curtain walls to the main façades of the slab block are of glass and blue porcelain enamel panels in an aluminium frame. 71, Maryland Casualty Building, New Orleans. Architects, Curtis and Davis; porcelain enamel sandwich panels in an aluminium frame. 72, Mt. Sinai Hospital Los Angeles. Architects, Welton Becket and Associates. 73, Pottstown Hospital, Pennsylvania. Architect, Vincent G. Kling.

religious buildings

74, Lutheran Brotherhood building, Minneapolis, Minnesota. Architects, Perkins and Will; blue-tinted glass and blue-green porcelain enamel panels in an aluminium frame; this must be the first time that curtain-wall transoms have been used purely for symbolism.

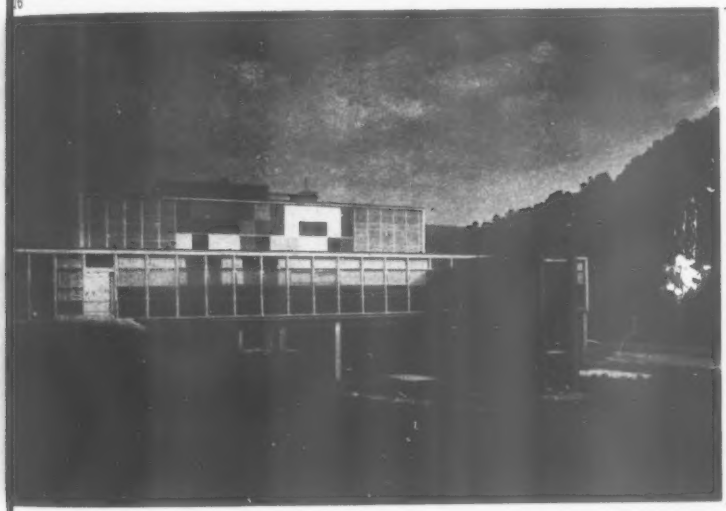
hospitals

and medical buildings

72

73

75 to 78, two of ten hospitals built for the Miners' Memorial Association. Architects. Sherlock, Smith and Adams. 75 and 76, at Whitesburg, Georgia.



'The window wall used on these hospitals was developed by a research team made up of representatives from the three architectural firms involved in the M.H.A. programme, together with experts from two steel companies. . . . in this sense, the walls were specially designed: since their use on these hospitals, however, they have become a standard product of the manufacturer and are readily available commercially. . . . The principal thought going into the development of these walls was devoted to providing a substantial mullion that would carry eyebrow sunshades (omitted in budgetary cutbacks, but subsequently restored) and to producing a porcelain enamel steel panel with sufficient insulation to equal that provided by masonry. The exterior panel face is separated from the inner by means of a vinyl gasket, to prevent temperature transmission. The outer plate is separated from the insulation by an air space to provide escape of condensation moisture from the assembled panel by means of drainage vents. The standard modular frame takes fixed glass, operating sash or the panel. The back of the window wall finishes flush, obviating the necessity for offsets in piping, etc., a particular convenience in these buildings which have a high velocity air distribution system.'

77 and 78, Miners' hospital at Harlan, Kentucky. Both hospitals illustrated employ specially designed curtain walls (for architect's comment see inset).

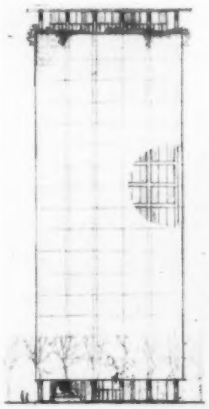
hotels

79

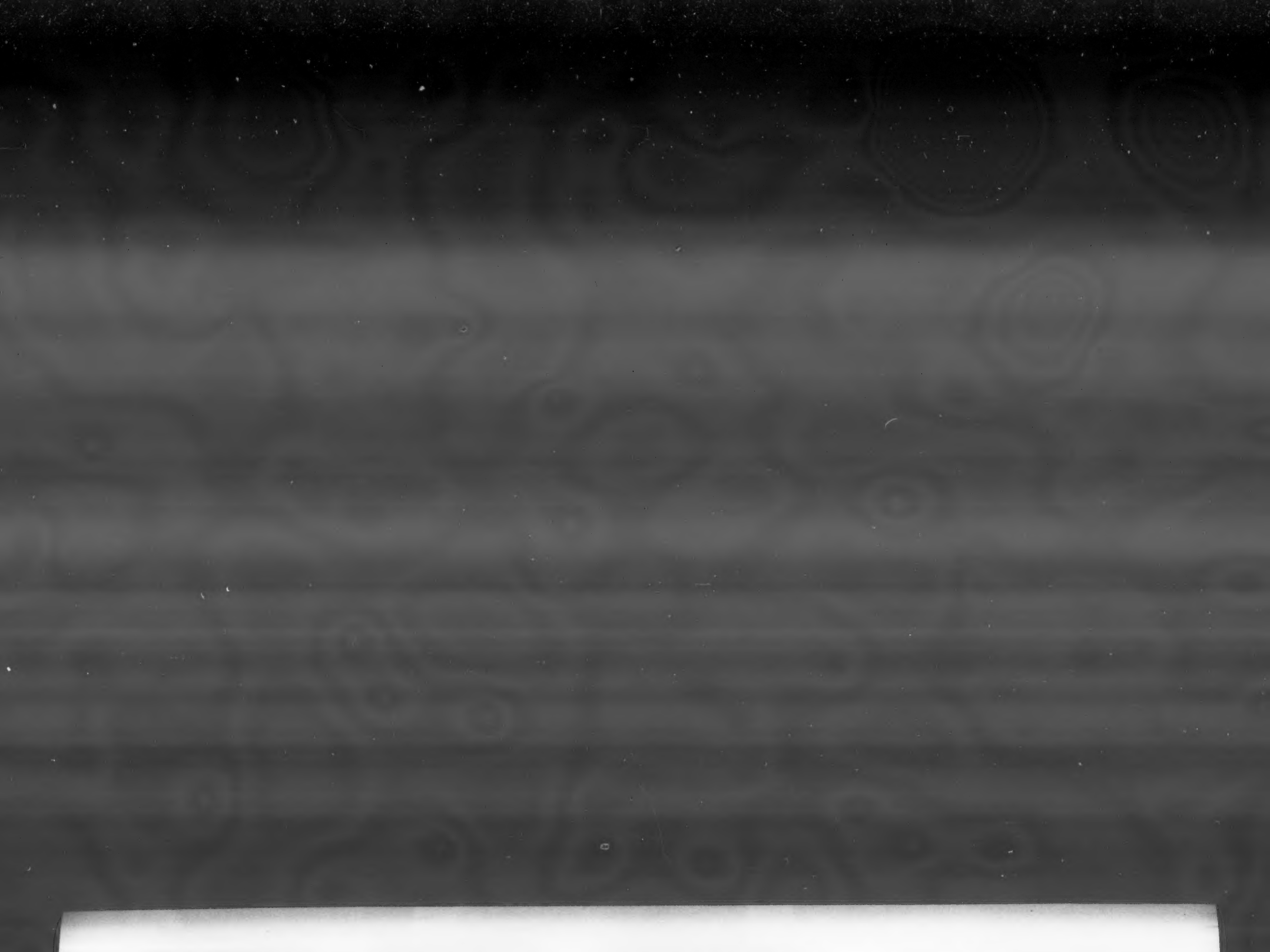
79, Statler Hilton Hotel, Dallas Texas. Architect, William B. Tabler ; curtain wall of blue-green glass and blue-green porcelain enamel in an aluminium frame. 80, proposed Sheraton Hotel, Philadelphia, Pennsylvania. Architects, Perry, Shaw, Hepburn and Dean ; porcelain enamel panels in an aluminium frame.

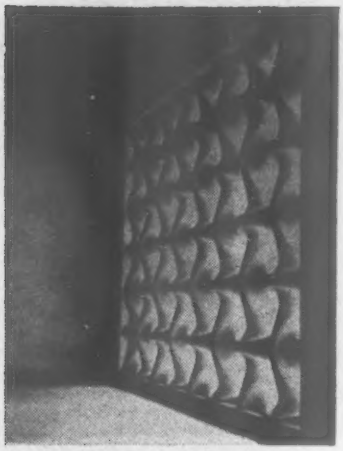
80

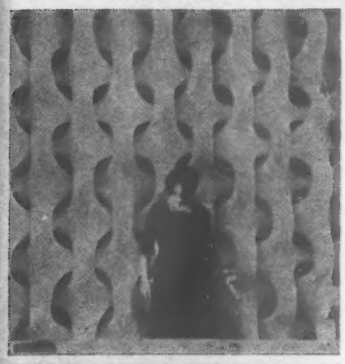
museum 81, 82

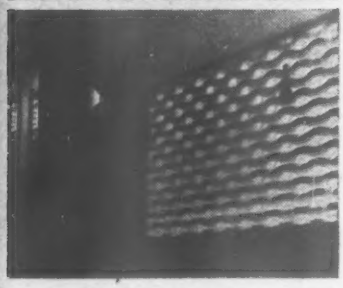


Proposed Huntingdon Hartford Museum, New York City. Architect Edward D. Stone ; 82 shows pierced bronze screen ; 81, cutaway showing the windows.









Concrete trellises designed by an Austrian sculptor Erwin Hauer.
Though all these examples use reinforced concrete in one way or another it is obvious that the use of plastics, either wholly or partially shop-fabricated, offer many possibilities in this direction.

30. The bronze screen by Bertoia in Skidmore, Owings and Merrill's Manufacturers Trust Bank, Park Avenue, N.Y., is shown

on page 359. The sculptural form above, in silhouette, was made by Pevsner for General Motors Technical Centre, Warren, Michigan.

continued from page 322]

perience with slum-dwellers who first use the bath in a new house for coals and then learn to bathe in it, suggests that a better environment can gradually teach better habits.

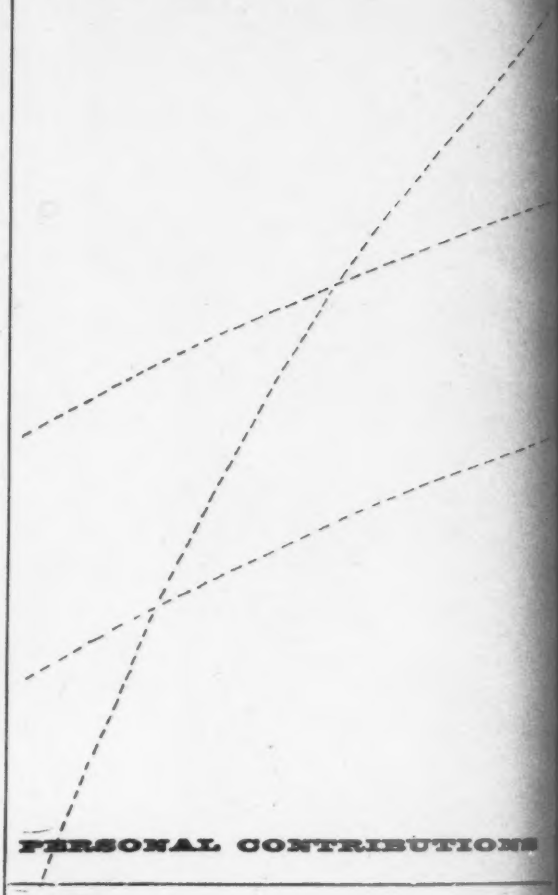
The neutral backdrop outside and the modulated interior within can bring new opportunities for collaboration between architects, painters and sculptors. Already some of the more remarkable contributions of contemporary artists to architecture have occurred within the framework of the American commercial structure;[30] yet the origin of each venture and the success of so many of them is seldom due to the building owners or tenants, there is little here of the patron-artist relationship of the past, instead it would seem to come from an astringency in the architecture which, with its absence of competing architectural 'artwork', leaves the field free for another kind of specialist—the man who knows what paint and metal can express when freed from the necessity to 'do' something useful. This is, of course, dangerous ground, particularly because it may, and probably should, only be take-off ground. Architecture, painting and sculpture will almost certainly come together again more closely than they do in the present relationship of frame to picture. Nevertheless, it's a good beginning, made even better by the extraordinary aptness of the best action painters and the sculptors like Bertoia, Nivola and Lassaw to this kind of architecture.

Standardized, rectilinear architecture is, in a sense, wiping the blackboard clean for a new combination of the arts. It is architecture setting up in minimum competition, so that new ways of defining and enriching space can be tried out, as it were, in a 'space-laboratory'. It is just as exciting when the same attempts are made within the moulded structure, but it is more difficult; for as soon as you have architecture of greater plastic complexity the relationship becomes involved. Since most recent attempts at close collaboration between the visual arts have foundered, perhaps what they needed was the kind of space where they could "reculer pour mieux sauter".

After all the arguments for standardization have been run through, many architects are still disquieted at the thought that the specialization it implies may mean a lowering in status. But this is true only for those who still think of themselves as the old-time all-round Gentleman Architect, whose status anyway descends daily because it fails to take account of today's needs. Only a very brief look at the situation here and in America is enough to show that where the architect gains respect and raises his status, he does so by delivering the goods, and what is more, delivering them on time; the goods in this case being efficient,

economical, weathertight, comfortable and good-looking buildings; much more than that the average man doesn't ask; indeed if he got that, the status of the architects and specialists who provided it would be very high indeed, but he too often fails to get it because without specialization it cannot nowadays be provided.

The position of the architect with outstanding creative ability (the artist-architect as he has been called here) is rather different. In common with all artists, society doesn't recognize its need of him quite as much as it does of the efficiency experts. His will often be the lonely struggle, aided perhaps by part-time teaching, and punctuated by competitions—until recognition comes. It may take him long to achieve this recognition or it may happen quickly; when he does achieve it, he may be over-valued or under-valued; he may even be valued for the wrong reasons; he may or may not make more money than the specialist; his status may be higher or it may be lower; to him this is, or should be, a matter of relative unconcern. The only thing we do know is that he's very valuable and there will be very few of him in any day and age. There are certain marks which distinguish him, though they sometimes turn out to be camouflage; however, what the public takes to be camouflage often turns out to be the mark of genius. Without him there would be no architecture, and without the lead of some of the greatest of his kind the anonymous architecture that has been the subject of discussion in this article would not have been worthy of consideration as the exciting and important new factor that it is.



PERSONAL CONTRIBUTIONS

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RONS

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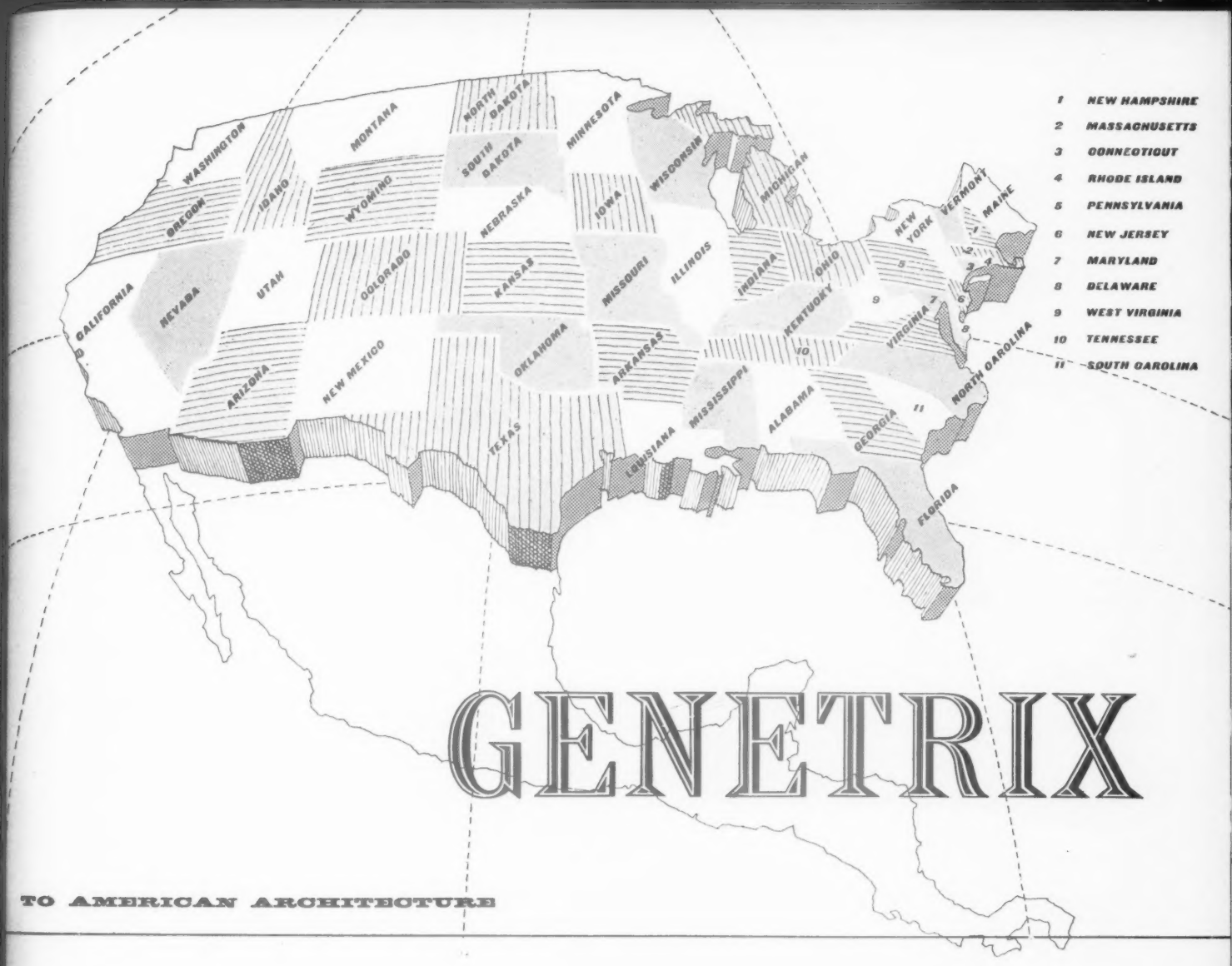


GENETRIX

TO AMERICAN ARCHITECTURE

The first part of this issue concerned itself with an aspect of architecture which is a collective achievement, many individuals have, of course, contributed to it, but its chief value comes from the fact that as well as being popular, practical and generally applicable it tends to discourage 'personal' expression in favour of raising the architectural quality of a standard product.

The part that follows traces the isolated contributions of the individual, of the men who make a valid contribution to contemporary architecture through a personal vision ; it attempts to trace each contribution to its source in a man's background, training, the vicissitudes of his career, his heroes, his outlook and his inner convictions. It is specially

designed to give architects outside America a more rounded picture of the American architectural scene. The outsider may be, and often is, aware of the latest news and pictures; he may have attended one of the lectures by architect-visitors to America—a growing phenomenon now that an American grand tour is becoming almost obligatory for the bright young European architect; he is aware of innumerable names, some of them famous and firmly established in his mind; but with many of the younger Americans it is often hard to relate names to buildings: the development of American architecture has been so rapid in recent years and the idiom is becoming so consistent that the picture seen from a distance spreads itself thin and takes on a distressingly two-dimensional appearance. One way to give it depth is to try to bring the personalities behind it to life.

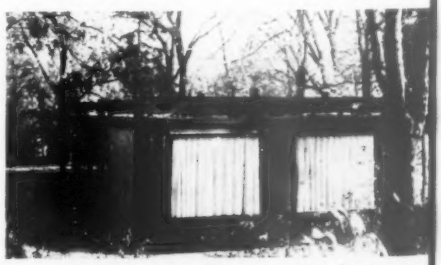
With this in mind, the architects that follow were sent questionnaires designed to 'draw them out'. The answers to these, accompanied by photographs of their newest works (and an occasional reminder of earlier ones), are published in order of seniority (Frank Lloyd Wright's work has been omitted at his own request). The aim is to give those who have not been able to see US architecture in three dimensions, a rounded picture of some of its architects.*

*The field is too vast to pretend that this can be more than an introduction to contemporary American architecture, and an interim one at that; there are parts—Texas, the south-east and the middle-west, for instance, which deserve more detailed attention than we have been able to give them here; and to which we shall return.

71

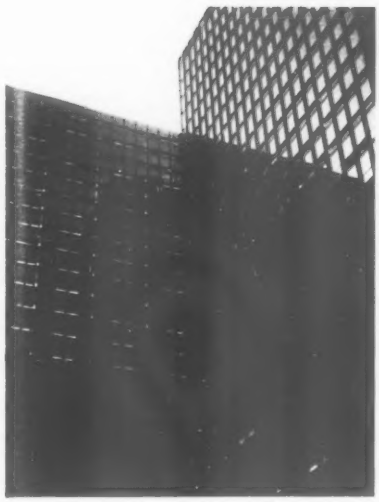
Chicago, Illinois

Mies van der Rohe, at the age of seventy-one and a long way from his native Aachen, has acquired the standing of a touchstone, the living embodiment of a moral absolute, by which US architecture may expect to be judged, a polarity opposed diametrically to Frank Lloyd Wright. However true it may be that his famous Lake Shore towers are the fulfilment of the dream of a glass skyscraper that had exercised him in Berlin as early as 1919, however true it may be that he is 'always the same Mies,' the fact remains that his coming to America in 1938 marks a real break in his career, and his American architecture is very unlike that which he had earlier done in Europe. The earlier body of work had consisted mostly of small buildings and large projects—except for the Weissenhof-siedlung of 1927, which was an event of International significance—and less and less of either as Germany's intellectual life contracted towards the null-point of 1933, at which null-point it was left to Mies, as its last director, to turn the key on what remained of the Bauhaus—and on what remained of an adventure, a generation, a dead world. The New World offered him the chance to realize his large projects; offered him the necessary patrons, the materials, the techniques, the engineers and collaborators—and the IIT campus, as its buildings were completed one by one over the



The new, Miesian, Chicago School at work—a house in Geneva, Ill., by J. C. Brownson, completed in 1952.

years on his twelve-foot planning grid, revealed to US architects an extreme point in architectural integrity, a right rectangular aesthetic of structure and space and precious little else. This aesthetic, summed up in two basic Miesian sayings, *Wenige ist Mehr* and *Beinahe Nichts* (Less is More, and Almost Nothing) has been called the 'Absence of Architecture,' but on a middle generation of Americans it has reacted as a positive presence, and as Mies has gone on developing it, refining and subtilizing its structural forms and formal structure, a giant ghost has followed it at a safe and not-quite-comprehending distance—the curtain wall industry. For, though Mies's achievement could hardly be more personal, the superficial appearance of the buildings in which that achievement is embodied has

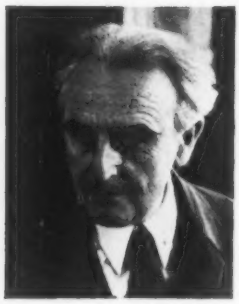


facilitated the visual acceptance of a repetitive, endless, grid façade, while the work of two architects most ready to admit his influence, Eero Saarinen and Gordon Bunshaft, has effectively bridged the gap between one man's vision and an industrial product.

America could not have nurtured Mies, Europe could not have fulfilled his promise; he has perhaps gained more from and given more to the US than any other emigré outside the realm of atomic physics. He has produced a lyricism of two constituent US psychological facts—unlimited space and unmitigated technology—in a form that is neither provincial nor crude, and can be held up to the rest of the world as an example of a convincing machine-age architecture. The rest of the world has taken note and, wherever architectural thought is on the move, the influence of Mies—*American* Mies—can be felt. Indeed, he ranks with Le Corbusier, Nervi and Candela as one of the fundamental form-givers of the fifties, and of no other American architect can this be said.

Esplanade Apartments, left, adjoining the original Mies blocks at 860 Lake Shore Drive, Chicago, have black-anodized aluminium trim and facings instead of the steel of the earlier scheme. The even more recent Commonwealth Promenade Apartments, of which the first two blocks are seen at right and above, have natural-anodized aluminium surfaces. The Cullinan Hall extension for the Museum of Fine Arts at Houston, Texas, below, has the usual Miesian structure of brick, steel and glass, but a curved plan, which is rare among his recent work.

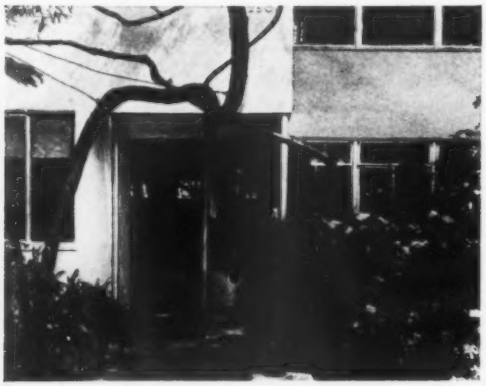
Above, the most famous, and the most controversial, of all pieces of Mies detailing, the I-section mullions on the elevations of 860 Lake Shore Drive, including the 'unnecessary' ones on the corner stanchions. Right, Crown Hall, the architectural school of IIT: above right, end wall; a pure and uninterrupted space-box, completed in 1956, and probably the most Miesian building there will ever be.



65

Los Angeles, California

Richard J. Neutra, almost alone of America's leading architects, has tangled at many points in his career with the great names of the Modern Movement. Born in Vienna in 1892, his early admirations were for Otto Wagner and Adolf Loos. In the early 'twenties he shared an office with Erich Mendelsohn in Berlin, and like Mendelsohn and Rudolph Schindler (another Viennese) he soon crossed the Atlantic and headed for Chicago and there met Sullivan and Wright. Unlike Mendelsohn, who returned to Berlin, he stayed on long enough in Chicago to help nurse Sullivan through his last illness, and then followed the path that Schindler had pioneered to the Pacific Coast. It was a classic education in Modernism, which he was soon passing on through his Academy of Modern Art to such rising talents as H. H. Harris and Gregory Ain. Ever since then, his rigorous and imaginative attitude to technology (which has its roots in the Neutra Family tradition), his thoughtful attitude to the psychology of architectonic form (which has its roots in his readings in the works of Wundt) have gained and maintained for him a solid reputation on both sides of the Atlantic, while the basic attitude which he derives from these interests, and sums up as 'Constructed human environment should be an entity, and not split up by specialists'. Both in his writings and his buildings he has shown a remarkable consistency over the years—works of 1927, like the 'Health-house,' and of 1955, like the Brentwood Gemological Institute, are equally unmistakably Neutra, even though they also bear witness to a careful and pondered architectural development. In spite of this quiet and self-effacing devotion to the problems of his art, he has attained wide public recognition, and deservedly.



Entrance to Richard Neutra's own house and office in Silver Lake Boulevard, Los Angeles, a pioneer experimental building of 1932.

Neutra (cont.) *Opposite page, constructed human environments by Neutra, exemplifying the extremities of his approach to house-design in the Fifties; above, a view-facing extrovert house at Ojai, Cal., below, a courtyard-facing introvert house at Bel Air, Cal. Left, a recent community building by Neutra, a Teenagers' club at Eagle Rock, which shows his continued command of cantilevered forms and precise detailing.*

Emmons, Wurster, Bernardi

61

San Francisco, California

The development and consistency of William Wurster's domestic work are shown by the

Gregory Farmouse, above, an early commission that won a House Beautiful award in 1927, and the Nowell house at Stockton, Cal., centre completed in 1953, but still maintaining the

Bay Region tradition. The Monterey Public Library, below, 1952, is one of a number of community buildings that have come from the office of Wurster, Bernardi and Emmons.

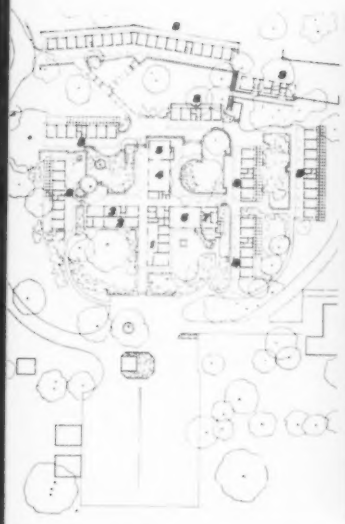
William Wilson Wurster was born at Stockton, California, in 1895; it was a town of 30,000 people in the Great Central Valley of the San Joaquin, and Wurster's father would take him on each bank holiday (he worked in a bank) to see some new aspect of it. Starting with a fire station, a foundry, a mill and leading through to the City Hall, County Court House and the offices of the local newspaper, until he got to know how the town worked in all its details. He decided to be an architect at the age of three, guided, he thinks, by his mother, who had been impressed by his question 'How do chimneys stay on roofs?' The motto of the New England side of his family was 'At least learn some one thing well—you can change to something else if a greater opportunity comes.'

During High School he worked in the summer for E. B. Brown, an English architect in Stockton, a gifted, irascible and unbusinesslike man, but it was a good office to be in and the work had character and style.

He went to the University of California in 1913 to study architecture under John Galen Howard; however, health and the first world war broke in and he didn't finish until 1919. At architectural school Wurster remembers himself as a conformist, and the whole group, prior to the 'twenties, missed the 'modern surge', though, even then, façadism made him uneasy.

The first office job after qualification was in San Francisco with an honourable, tight-fisted architect of Scottish descent; he obtained his work as a brother-in-law of the mayor, but his performance was beyond reproach. It was not, however, a gay office. Wurster left to work for Charles Dean in Sacramento on an engineering project; there he learned all the field things fast, designed and built

Wurster (cont.) *The most discussed of Wurster's recent works is the group of buildings designed for the Ford Foundation's Centre for the Advanced Study of the Behavioural Sciences, Stanford, Calif., a cluster of buildings for high-level thinking. Right, a reading room in one of the blocks numbered 8 on the plan. Key to plan: 1, administration; 2, library; 3, seminars; 4, meetings; 5, lounge; 6, dining; 7, kitchen; 8, study groups.*



three houses on the side, saved $4,000 in two years and in 1922 set off for a year in Europe.

On his return he worked in New York with the firm of Delano and Aldrich until 1924, when he moved back to the Bay Region, starting his own office in 1926. One of the earliest commissions was the Gregory Farmhouse, designed in one day; it was carpenter architecture (a protest against the, then popular, Spanish stucco) and when it won the second House Beautiful award in 1927 Wurster was 'off to the races'. He now has two partners, Theodore Bernardi and Donn Eamons, and twenty-seven assistants; sharing the office are mechanical and structural engineers who have other clients as well.

Wurster's chief admirations are Alvar Aalto (in architecture), Barlach (in sculpture) and Cézanne (in painting); he regrets that his clients usually seem to prefer Cadillacs. A constant source of inspiration has been his fellow-townsman Maybeck, whose work is an embodiment of what Wurster considers an ever-relevant dictum—'Let's use the past and yet be free'.

61

New York City

In 1932 William Lescaze and the late George Howe took a vital step toward the establishment of Modern Architecture in the US with their Philadelphia Savings Fund building, below, left. Lescaze's block at 711 Third Avenue, New York, below right, though twenty-five years later, clearly shows the same hand at work, particularly in the way windows, columns and overhang are handled.

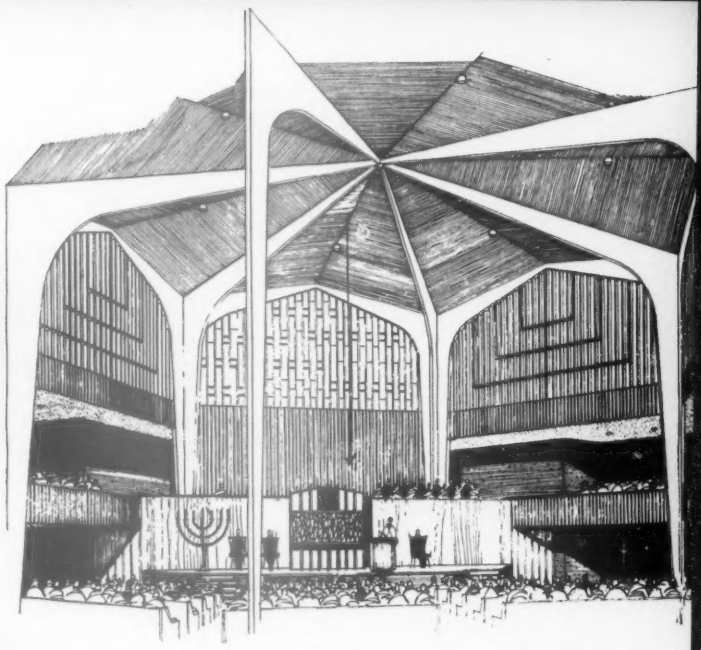
William Lescaze was born in Switzerland in 1896, and still ranks as a pioneer modernist in the US. He will be remembered longest and with greatest respect for the Philadelphia Savings Fund Society building, of 1932, in which he and George Howe achieved the first truly modern skyscraper block; modern in its structure, modern in its services (which included air-conditioning), modern in its aesthetics. At the time of its erection it was regarded as an 'Internationalist' design, but events have over-run opinion, and PSFS now appears as the true ancestor of some of the most conspicuously American buildings of the post-war years—including many of Lescaze's own. Since 1934 Lescaze has worked on his own, or in ad hoc association with other architects, and at present he works with two architects as associates, and a staff of seventeen divided between two offices in New York. He has been in the US since 1920, and went there more or less at the instigation of his teacher in Zurich, Karl Moser, who said of his school designs 'Where are you ever going to find the chance of doing monumental work? Egypt? It's too late. Maybe America.' However, he has not lost the European connection, and quite apart from the Swiss Pavilion at the New York World's Fair of 1939, he has also designed a series of buildings for Dartington Hall that can still astonish the tourist in picturesque Devon.

57

Cambridge, Massachusetts

Pietro Belluschi, whose work in and around Portland, Oregon, is a four-star example of the architect's integration into the life of his local community, comes from as far away as Ancona, in Italy, where he was born in 1899. He passed, by way of training in Rome, and a degree in civil engineering at Cornell, to the office of A. E. Doyle in Portland, which he served as chief designer from 1927 until the firm was dissolved in 1943. He then set up his own practice, but this, in turn, no longer exists as a normally constituted office, and Belluschi now works as a roving consultant in design, especially in the fields of church architecture, shopping centres, and office buildings. His work in these three fields is so dramatically dissimilar that he eludes routine evaluation as an architect in terms of style—whether personal or generalized—and he has been appreciated mainly for his achievement in building up a position in which he can design buildings that command respect in the often deadening mental climate of a provincial city—though in this respect Portland is as a-typical as he is. But the stylistic adaptability is as integral a part of his make-up as the community-consciousness, for both are aspects of what he calls 'the kind of integrity that breeds variety as nature will have it'—*nature* in this instance clearly subsuming the character of the community as well as the building's function. And the variety which such nature breeds has precipitated him into some pioneering situations that have kept the community of Portland well in the forefront of symptomatic architectural developments, and made 'North-West Architecture' a term to conjure with. His churches and houses, wood-framed, wood-clad, and often likened to local barns, were early in the field of 'redwood vernacular' and were taking circumspect note of Japanese architecture as long ago as 1938. On the other hand, his business buildings, square, smooth and sharp-edged, include in their number the Equitable Building of 1948, which anticipates much of what was later to be done at UN and Lever House, though not, like them, a sheath-type curtain-wall.

Above, Platts house, Portland, Oregon (1941) and below, the Burkes house (1949); both show the influence of the north-west's redwood vernacular.

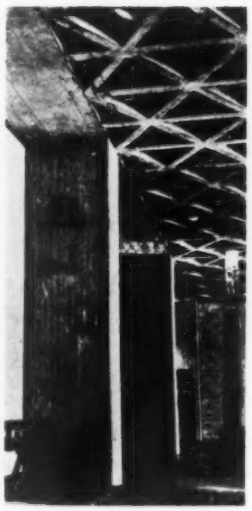


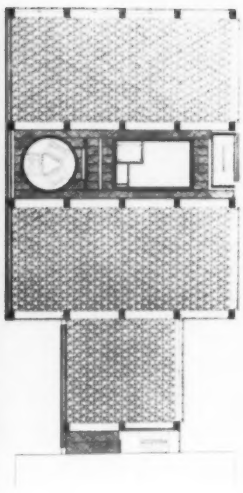
Above and below, the Temple Israel at Swampscott Massachusetts, designed in association with Carl Koch and Leon Lipshutz. The hexagonal sanctuary, above, derives its shape from the Star of David; its structural members are of laminated wood. In the exterior view, below, the projecting wing on the left houses the vestry and that on the right, a library, the block linking them to the sanctuary is an auditorium which can be made one with the sanctuary by unfolding partitions.

Above left, the Marion County Court House, Salem, Oregon, in which Skidmore, Owings and Merrill were supervising architects. Above, right, the entrance to the Salem YWCA.

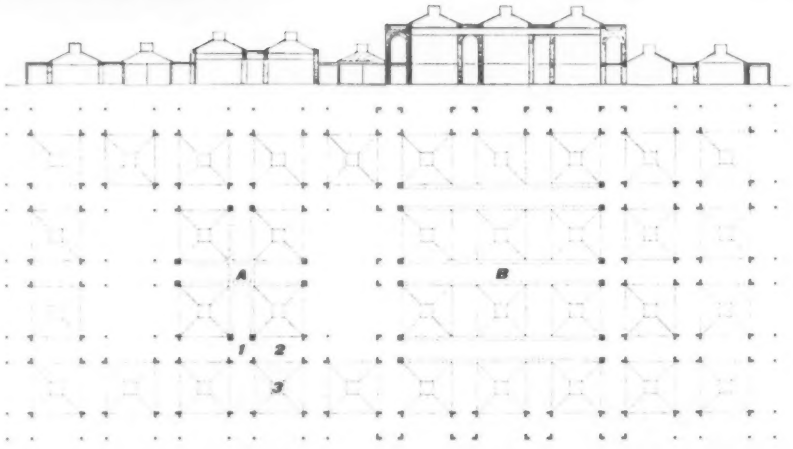
56

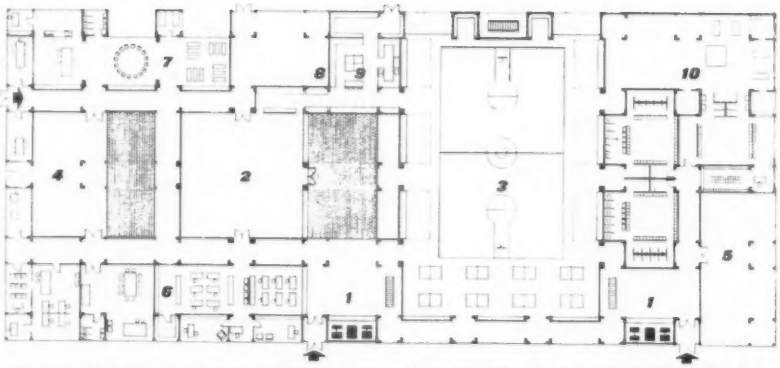
Philadelphia, Pennsylvania





Left, detail of ceiling and columns and a ceiling plan, of the Yale Art Gallery, 1955. Of all Kahn's buildings this one shows most vividly his perception of the architectural potentialities of new structural systems, as well as his knack for making raw concrete, cement blocks and wire mesh into entirely satisfactory finishes. Above, first stage of a public housing project in the Mill Creek area of Philadelphia; building began in 1953 and is still continuing. Below, section, roof plan, model and ground plan of a community centre for Trenton, New Jersey. Column plan: 1, column centre space 11 ft. by 11 ft.; 2, oblong connecting space 11 ft. by 22 ft.; 3, major space 22 ft. by 22 ft. A, social hall; B, gymnasium. Ground plan: 1, lobby; 2, social hall; 3, gymnasium; 4, adult lounge; 5, youth lounge; 6, administration; 7, nursery unit; 8, shops; 9, kitchen; 10, turkish bath.





Louis Kahn was born on the island of Osel in Estonia in 1901. His father was an artist and a worker in stained glass; his mother, a harpist. Kahn started to draw at an early age and during his 'teens won annual prizes, finally being offered two scholarships to the Pennsylvania Academy of Fine Arts; instead, at the age of sixteen, he decided to be an architect, and chose to study at the University of Pennsylvania.* His first job was in the office of the Philadelphia city architect where he was put in charge of design for the Sesquicentennial Exposition of 1926 but, in his own words, he 'simply applied the stylistic design-making tendencies of the day to a unique problem of spaces and communications in a made-up world'. A lost opportunity he wishes he could have over again.

He next went to the office of Paul Cret (who was head of the University of Pennsylvania's architectural department), where the assistants were so many sorcerer's apprentices, reconstituting under the master's watchful and educated eye, ingredients from old Beaux Arts recipes.

The first independent job was a small synagogue, the second the original unit of a psychiatric hospital; both came from clients who must have felt, he thinks, that a young man would give them more for their money. His office now includes seven assistants and, on top of his practice, Kahn teaches at Yale and the University of Pennsylvania.

He sees no necessary opposition between 'organic' and 'standardized' architecture. He considers architecture as 'the thoughtful making of spaces'. 'Organic' qualities in architecture stem from an intuitive understanding of order, the order of spaces, of structure, of building, of services, of movement, all taken separately and together. Forms that come ahead of thought about space interfere with the development of its organic qualities. 'Standardized' architecture implies, he considers, 'stabilized means, static space and accepted function.'

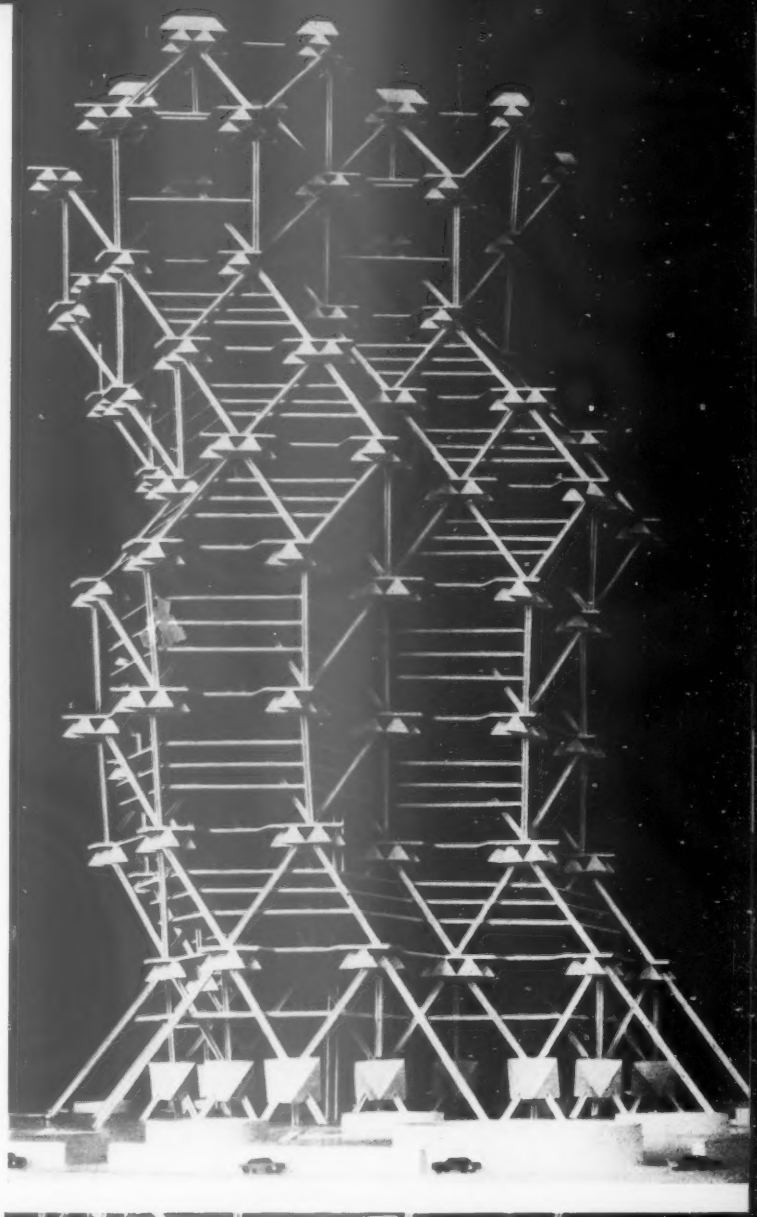
'Space is architectural when the evidence of how it is made is seen and comprehended. A single span space with intervening non-structural partitions raises the question as to whether it is meaningful form when shorter spans could be truer to the nature of the spaces. An "order-concept" of space could inspire the design of structurally defined spaces that "serve" and are "being served"; the large, the intimate and even the smaller voids in a structure (see Yale Art Gallery) should be inherent in that order-concept.

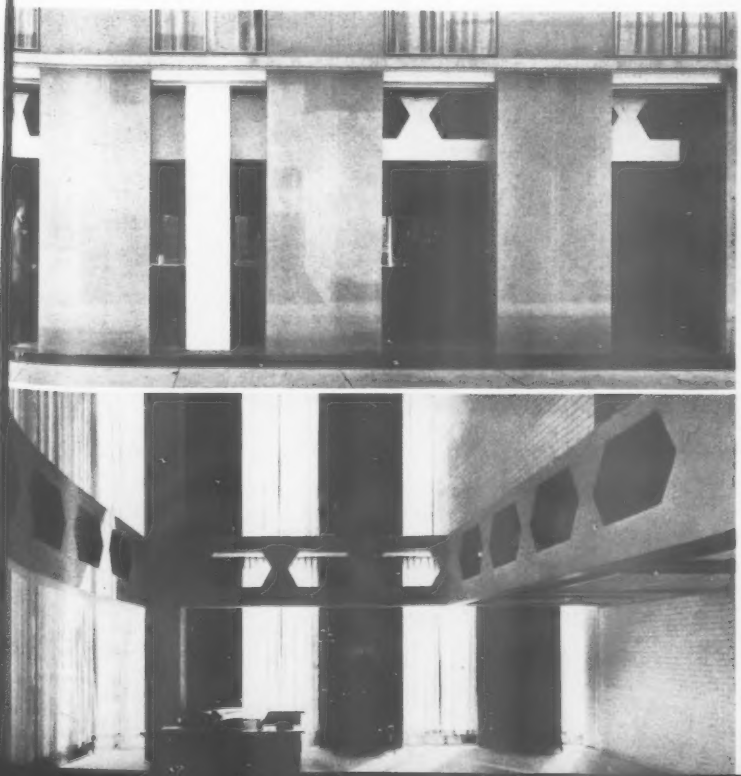
'The continual renewal of architecture comes from changing concepts of space. Long ago, when the walls parted and became columns, architecture began. Are there signs of another transformation, equally far reaching? Are glass, steel and reinforced concrete enough to inspire a new era in architecture? The changing nature of space suggests constant beginnings in architecture. Does not a street want to be a building? What does redevelopment of our cities mean without an order-concept of movement which gives architectural form and logical position to the harbours of stopping. I believe firmly that we will become even more attuned to qualities that exist in the spaces that "want to be"—qualities that transcend function and circumstances.'

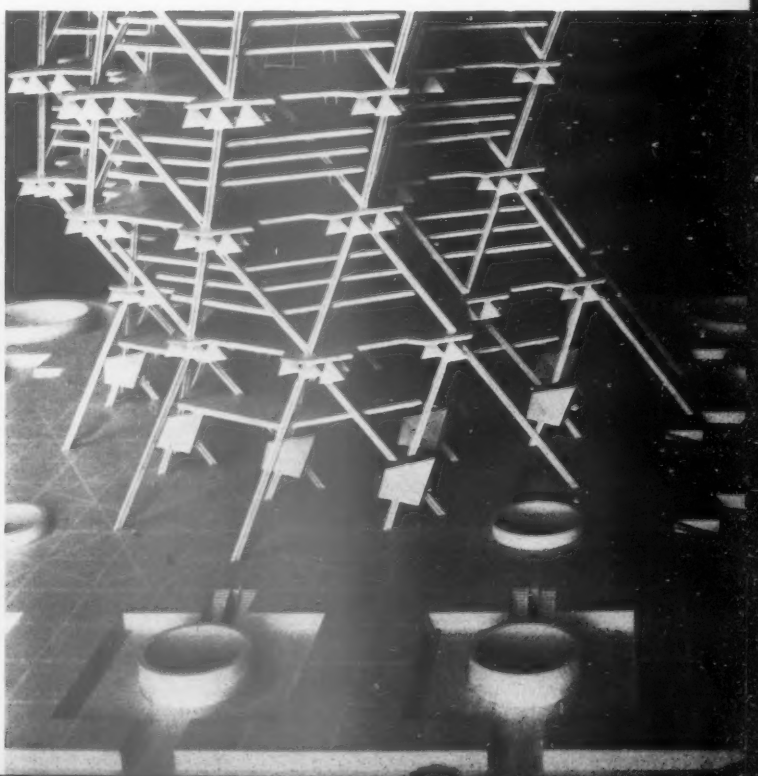
*Music is Kahn's other interest and he could have had a scholarship to study that too, for the asking.

A Bath House adjoining a swimming pool in Trenton, New Jersey, 1955; the view is from the atrium looking towards the elevated pool and shows the baffled entrances to the dressing rooms through hollow columns at each side. Below, ground plan and roof plan of the bath house. The hollow columns are 8 ft. by 8 ft. square and are servant areas of the major spaces. The enclosing walls of the dressing rooms are flush with the outsides of the columns to allow the sun to enter. A, women's dressing room; B, men's

dressing room; C, basket room; D, atrium; E, lounge; 1, pool director's kiosk; 2, entrance to chlorinating equipment; 3, lavatories; 4, baffle. Right, model of a tower resting on a 700-ft.-square piazza. The structure demonstrates the predominant influence of horizontal wind forces over the forces of gravity in the design of high buildings. At the four corners there are street level entrances down to parking spaces; the square courts are for pedestrians, stairs from these give access to the piazza above, and escalators lead down to the parking level. The large circular openings are for lighting and ventilating the shopping concourse on the intervening (street) level, as well as the car park. Below, exterior and interior of a Medical Centre just completed by Louis Kahn in Philadelphia.







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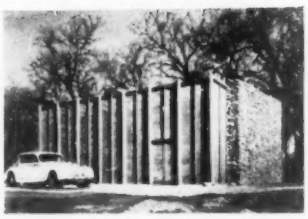
San Francisco, California



Mario Corbett was born in New York City in 1901, the son of an architect, and spent his childhood in Southern California. He received his training in his father's office, starting at the age of thirteen, and in 1919, until 1922, went to the San Francisco School of Fine Arts, following this up with ten years of work in offices he considered the best: Reginald Johnson and Myron Hunt in Los Angeles; John Byers, Santa Monica; Arthur Brown, San Francisco; Kenneth Murchison, New York.

In 1934 he opened his own office in San Mateo, a suburb of San Francisco, but found it stultifying and in 1937 moved to the city. His office staff varies between one and seven and is in the lower part of a two-storey building with penthouse on Telegraph Hill, San Francisco.

He finds the example of Bernard Maybeck an inspiration, though he doesn't believe his work much resembles Maybeck's; but in the refusal to kowtow to the faddish and the fashionable and in the sensitive and adventurous use of materials Maybeck, he believes, has many lessons to teach the architect of individuality.

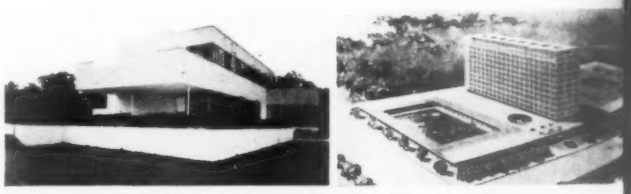
Left, above, the Thomsen house, Vina, California. A screened porch extends along the whole house front and between it and the living-room floor is large-scale planting. Above and left, three views of the Hope Lutheran church, San Francisco. Middle left, the narthex, lower left, the east end. Above, west elevation. Redwood is the predominant material and the pews are of white ash.

55

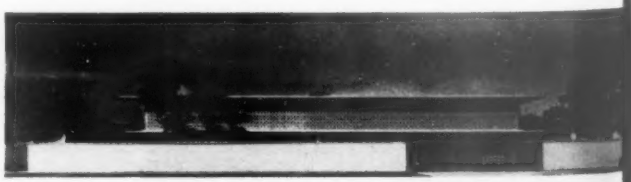
New York City

Edward D. Stone was born in Fayetteville, Arkansas, in 1902, and had a brother, James Hicks Stone, also an architect, with a practice in Boston. His earliest architectural recognition came at the age of twelve, when he won a first prize of two dollars fifty in a Birdhouse competition. Five years later, the sight of New York from Brooklyn Bridge fired him to make his own contribution to the New York scene—an ambition that came to significant fruition in the Museum of Modern Art, which he designed in collaboration with Philip Goodwin, in 1937. Between the decision and the realization, he studied at the University at Arkansas, Harvard and MIT, and travelled in Europe on a Rotch Scholarship, designed the Radio City Music Hall, pioneered Modern domestic design in the Eastern States (Mandel Residence, 1930) and established his own office in New York, in 1936. The firm is still called *Edward D. Stone, Architect*, and has no partners or associates, but there are now subsidiaries of the New York office in Fayetteville and Palo Alto, with a total staff of thirty-nine for the three offices.

Since the war Stone's work has become—in a very conspicuous sense—representative of American architecture, since he has designed a number of important buildings and projects outside the US, notably the hotels *El Panama* (in Panama) and *Phoenicia* (in Beirut) and another one projected for Karachi, the US Embassy in New Delhi (which Frank Lloyd Wright suggested be called the *Taj Maria*, in honour of Stone's wife), the US pavilion for the '58 Brussels exhibition, and a large hospital in Lima, Peru. At home, the Palo Alto office is particularly flourishing, with a large volume of institutional building in California in hand. With so much tropical and sub-tropical work in the office, it is hardly surprising that the pierced screen and deep eaves should be almost the trade-marks of Stone's work at present, and it may be these qualities that earned him the rarely-dispensed admiration of Frank Lloyd Wright—'a young man with a brilliant future' were the Master's words. This admiration is reciprocated, and he also admires the work of Alexander Calder (which he used in his Arkansas university buildings), Henry Moore, Matisse, the town-planning of Bath, Piazza San Marco, and Baroque Rome.

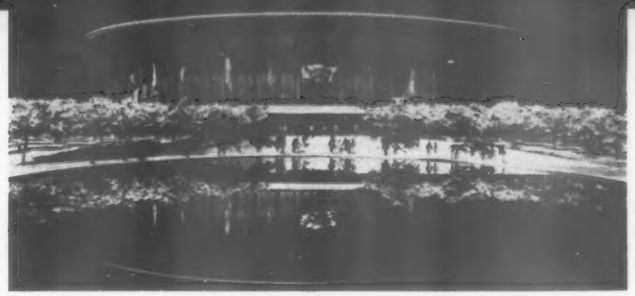


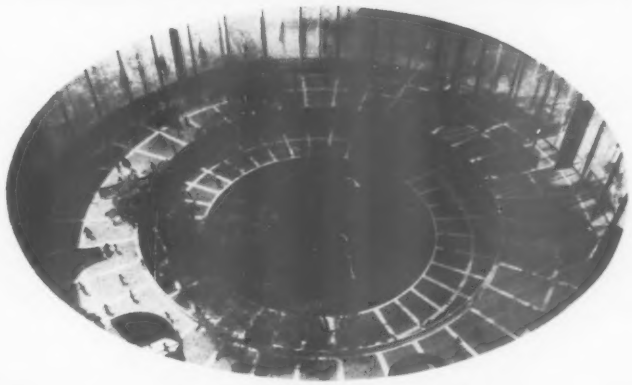
Above left, the Mandel house, Mount Kisco, New York, 1930. Above right, a 400-room ten-storey hotel five minutes by car from the centre of Karachi, Pakistan. The more important of the public rooms on the ground floor are combined into one space, separated by glass partitions and grouped round two courtyard gardens.



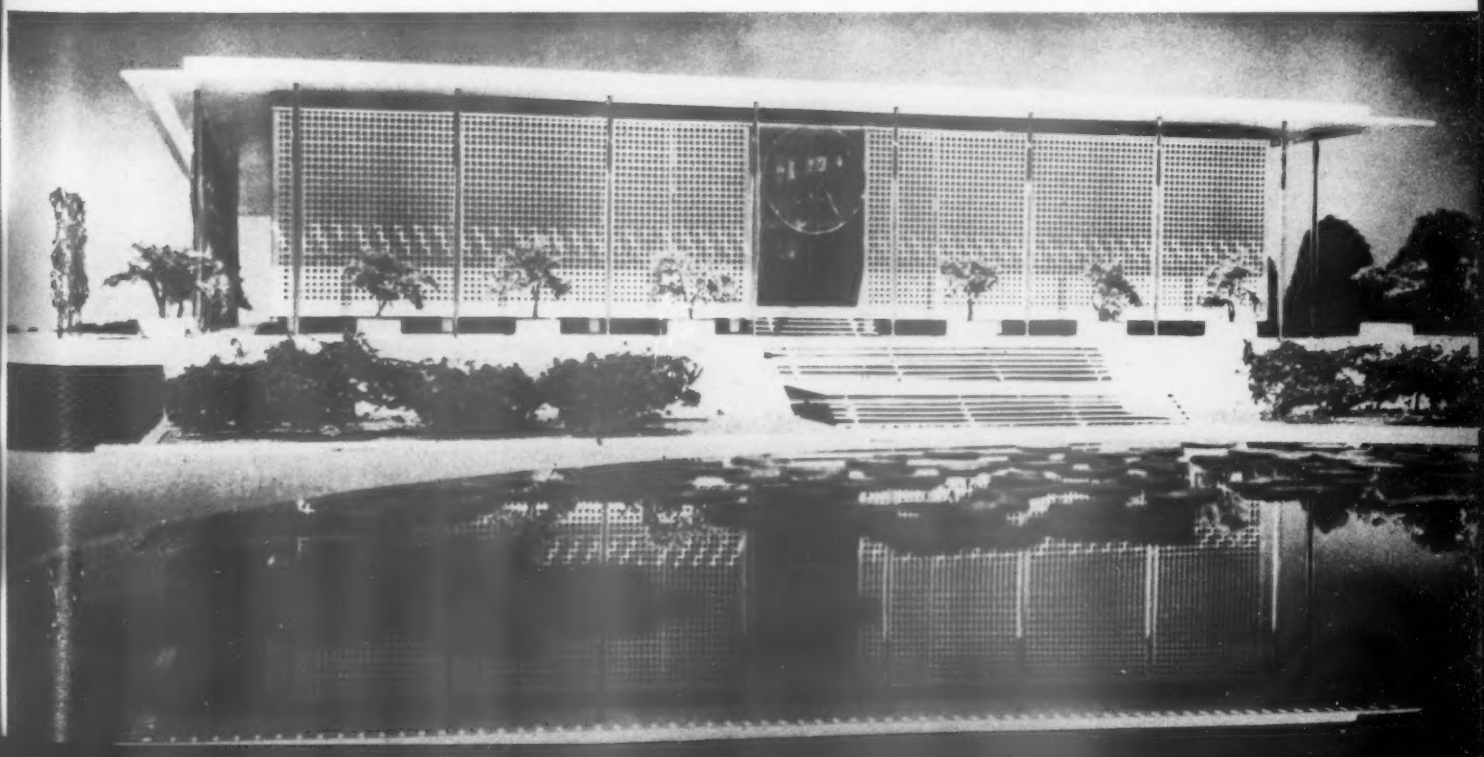
Above, the Graf house, Dallas, Texas, which has an external pierced screen wall for sun protection.

Above, nursing wing of the proposed Palo Alto Medical Centre, Stanford University, California.





Stone (cont.) *Left and left above, model of the United States pavilion at the Brussels World Fair, 1958, by Edward Stone, showing views of the exterior and interior (oval). The building has a diameter of three hundred feet, covering an area about the size of the Colosseum. The roof construction resembles that of a bicycle wheel, with outer, compression, ring connected to an inner ring by high-tension steel cables; the roof will be covered with translucent plastic over a metal mesh; the outer ring will rest on two concentric rows of columns and hung between them is a honeycomb wall of plastic sealed with an undulating plastic skin. Colours are gold, crystal and white and in the centre of the interior exhibition space is a large water garden surrounded by existing willow trees. Above, the El Panama hotel at Panama. Below, model of the US Embassy at New Delhi, now under construction. It will be of reinforced concrete with an outer row of gilded steel columns, a double roof, a pierced sun-screen wall of tiles and an interior water-garden court roofed by suspended strings of aluminium discs to give the effect of sunlight filtering through leaves. The whole building is raised on a rectangular platform with entrance for cars and parking space below it.*

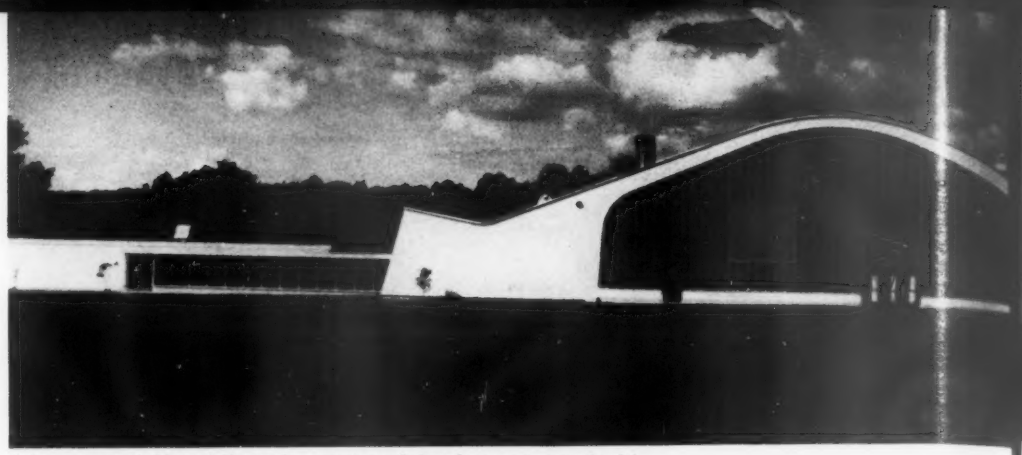


54

New York City

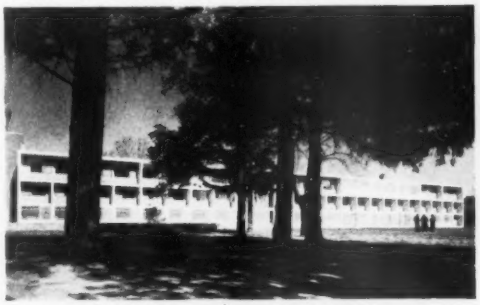
Marcel Breuer, outstanding product of the Bauhaus's most brilliant period (1920-24) and designer of its most famous artefact (the steel tube chair), was born in Hungary in 1902, and decided to become an architect in 1904. After his Bauhaus training, and a phase when he combined headship of the Bauhaus interiors department with independent design-work outside, he passed by way of the Isokon network (which also handled Gropius and Moholy-Nagy) and collaborations with F. R. S. Yorke in England, to the USA in 1937, to team up with Gropius once more, teaching at Harvard, and partnering him as an architect. He was thus among the spearheaders of full, European modernism in US Academic circles and in New England house-building, and he has left his mark in both fields.

In house-design, however, he has made his deepest impression since the partnership with Gropius was dissolved in 1941, particularly with his 'butterfly' exhibition house for the Museum of Modern Art, which was visited in 1949 by over 70,000 people, and probably did as much as anything to sell split-level sections to the US public. Epoch-making as this may have been in the context of US housing at large, in the context of his own work it was only one of a series of remarkable houses produced by him between 1945 and 1955, houses marked by an extensive, original and authoritative employment of wood and stone. The successes of this period, and the very high quality of the work he put into them, focused attention on him as a house-architect more than anything else, but he had always possessed the abilities and ambitions for larger work, and in the very middle of his house-period he designed a dormitory for Vassar and the Arts Centre for Sarah Lawrence College. Since then projects and work in hand outside the domestic field include schools and college buildings, a factory, a monastery, and two widely-discussed designs done in collaboration with Europeans in Europe, the UNESCO buildings in Paris, with Zehrfuss and Nervi, and the new *de Bijenkorf*, Rotterdam, with Elzas. With both these latter teams he maintains project offices, as well as his own office in New York, where he has three associates and twenty assistants. As might be expected from one of the Bauhaus's star pupils his work is unforcedly personal, but never individualistic, and—as might also be expected of an old Bauhaus student—he has a distinguished roster of collaborators from the other arts.

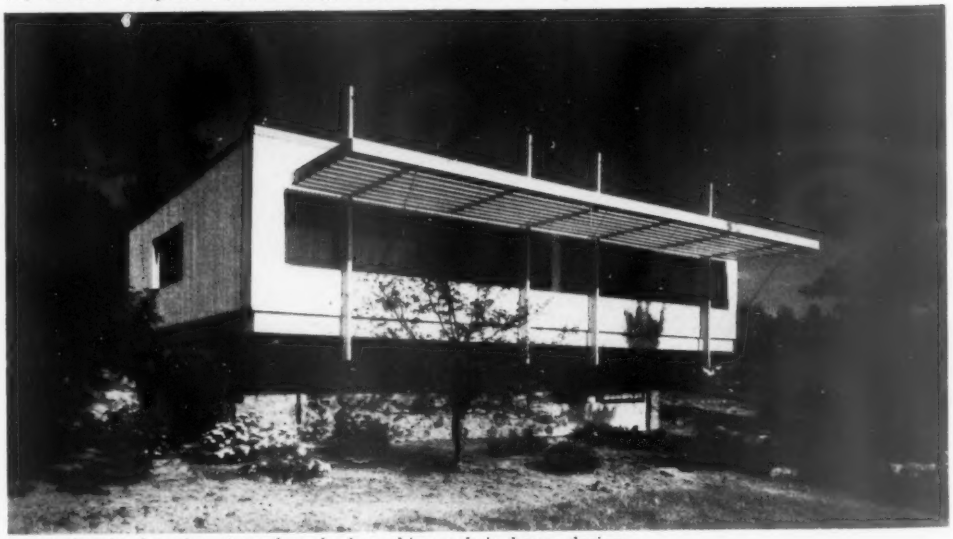


A large part of Marcel Breuer's recent work has been concerned with educational buildings of a very varied kind: above, a classroom wing and the gable wall of the gymnasium at Litchfield High School,

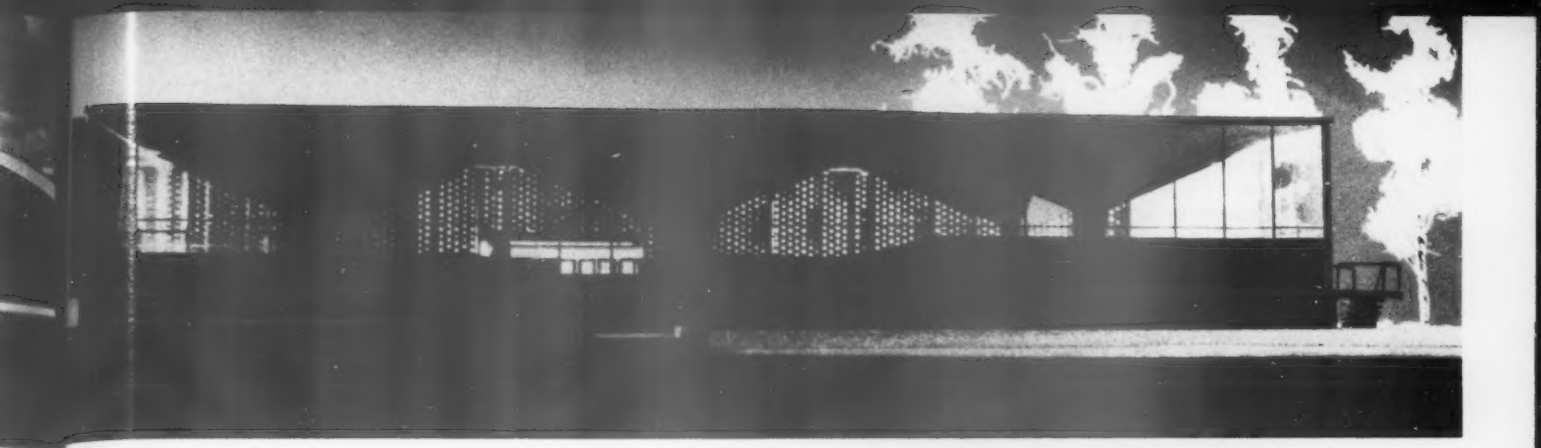
Conn.; for the Sarah Lawrence College, Bronxville, NY, he designed in 1950 an Arts Centre, left, above, with a dance-studio, right, above, under the rake of the auditorium floor; and for St. John's Abbey,



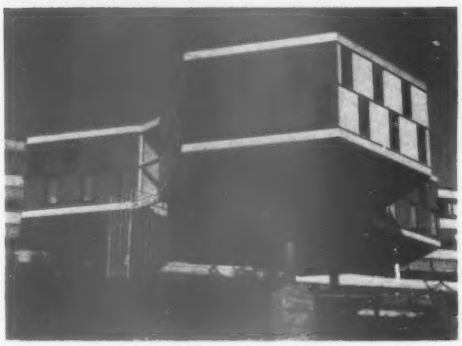
Collegeville, Minn., a large programme of extensions (AR, July, 1954) of which the monastery wing, above left, has been completed—the abbot's reception room is seen above right. Breuer's post-war



reputation in America stems largely from his work in house-design—the Grieco house, Andover, Mass., with its boarded exterior, wire-braced sun-shade and binuclear planning is typical of his manner in the 'fifties.



Breuer (cont.) *Among the varied commissions that have come Breuer's way in recent years have been the new library block for Hunter College, New York, above, the design-overhaul of the New Haven Railroad —a projected paint-job for Train X is seen below—and the site office for the building work on the new* de Bijenkorf *store in Rotterdam, below right.*



Left to right: Contini, Baumfeld, Gruen, Van Leuven.

53

New York City

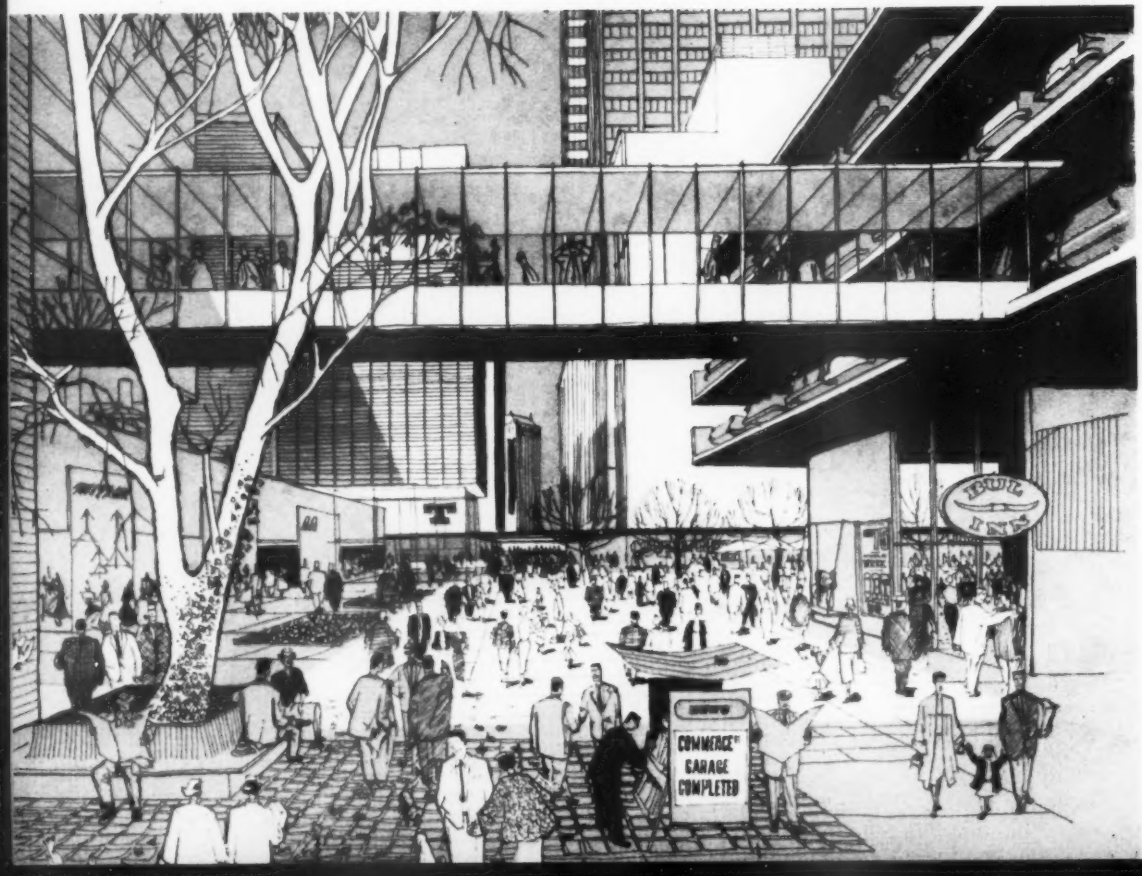
Victor Gruen was born in Vienna in 1903. His father was a lawyer, whose interest in the theatre and abilities as a pianist led him to represent many theatres, actors and musicians; he died when Gruen was fifteen and had no influence on his choice of career except to warn him not to become a lawyer and to bequeath him a friend who was an architect and into whose office Gruen went after training in a school of architecture. Parallel with his work in the office he studied at the Academy of Arts under Professor Behrens (passing an entrance examination which had been flunked a few years earlier by Adolf Hitler). Those who had the strongest influence on him at that time were Adolf Loos (whose obituary he wrote for a Viennese newspaper) and Le Corbusier, whose concepts of 'La Ville Radieuse' he wrote about in Austrian magazines. He spent nine years in the office of Melcher and Steiner, and then set up on his own, winning a prize in a housing competition entered with R. L. Baumfeld (one of his present partners in America) and Karl Langer (now practising in Australia). However, economic conditions didn't favour large-scale building projects at that time and work in the office was mostly concerned with decoration and

Victor Gruen's first store-design in the USA was Lederer's, below left, on Fifth Avenue, New York, done just before the War. Although the growth of his firm's reputation has largely depended on its skill in handling store and shopping-centre problems, its output is by no means restricted to such work, and a small office building for medical services in the Los Angeles suburbs is seen below.

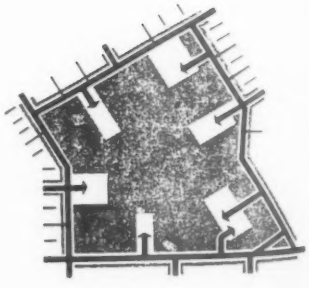
industrial design (a store front for the Deutsch Men's Store was published in the ARCHITECTURAL REVIEW in 1938.) A large commission for a department store in Vienna coincided with the arrival of Hitler in Vienna, and after three months, when all seemed lost, Gruen obtained a visa for the USA and in July 1938 left with his family, T-square, drawing board, books and $8.

After a period of struggle which included helping to produce two shows on Broadway, Gruen met by chance a man he had known in Europe, who commissioned him to design a store (see page 349). The firm now has five partners and thirty-two associates, employing in all between 150 and 250 men. There are two production offices, in Los Angeles and Detroit, and four smaller offices, in New York, San Francisco, Minneapolis and Miami. The organization includes structural, mechanical, electric and civil engineers, interior designers, graphic designers and specialists in traffic planning, landscaping and other fields. Gruen believes there is a serious division in American architecture between, on the one hand, an 'austere, formalistic attitude to architecture which subordinates human needs, utility and even the rationale of technique to preconceived and personal, ascetic concepts' and, on the other, a 'humanistic approach in which forms are derived from a careful study of physiological and psychological human needs and from the logical use of techniques'. He thinks that America is at present facing a fad for structural ingenuities, expressing itself especially in roof forms, resting on four points, three points and two points (he awaits breathlessly the one-point supported shell). He blames this, as do a number of other American architects, on the desire for publicity.

Gruen (cont.) *The most famous of Victor Gruen's shopping-centres is still Northland, outside Detroit, and the air-view above of the centre and its parking lots emphasises the sheer size of the problems involved in its design. Subsequent Gruen shopping centres have made even more lavish use of applied arts—below left, is the court of Southdale Centre, Minneapolis—but some have been on a more intimate scale, as is the Pala, at San Jose, Cal., below.*



Gruen's proposals for A Greater Fort Worth Tomorrow *are—consciously—the application of his shopping-centre planning methods to a central area, automobile penetration being restricted to peripheral parking zones, and the rest of the area made over to pedestrian circulation at various levels, below. The resultant urban scene, left, has an aspect that will be familiar to readers of* THE ARCHITECTURAL REVIEW, *and its repeated pleas for the creation of pedestrian networks in central area re-developments.*



53

Pittsburgh, Pennsylvania

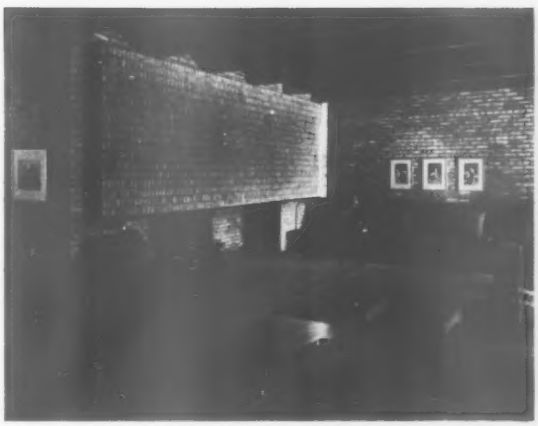
Paul Schweikher was born in 1903 in Denver, Colorado, where his father was President of the Western Institute of Music; he was a pianist and an organist.

Schweikher left Denver at the age of 18 to study painting at the Chicago Art Institute, but switched abruptly to architecture. What decided him was not the example of Sullivan or the presence of Wright (he didn't know of the existence of either until a year after the decision) but the city itself and the impression its vigour in life and building made on a newly arrived far-westerner. This was in the early 'twenties. After I. I. T. Schweikher worked with David Adler, well known then for his skill with 'English Georgian'; in 1927 he left for Yale, graduated in 1929 and then travelled in Europe for a year on a Matcham Fellowship.

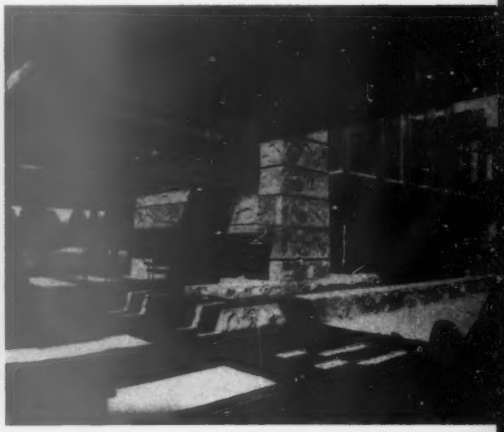
In 1930 he returned to Chicago and found a job in the office of Robert Work and Russell Walcott; emphasis was on technical expertise—it was good discipline. After the depression life became a matter of imaginary projects; some were done with Keck of Chicago and Beatty of Wisconsin, and the group held an exhibition in a local Chicago gallery. It coincided with the visit of the International Exhibition of Architecture organized by Henry-Russell Hitchcock and Philip Johnson, and Hitchcock was impressed with their work, though it was too late to incorporate it as a local entry in the International Exhibition; instead they were invited to show at the Museum of Modern Art. The first commission came shortly after, as the outcome—a small music school and house for David Dushkin and his wife, Dorothy (counterparts, Schweikher suggests, to the Dolmetschs). Built around 1933-34, at Winnetka, Illinois, the Dushkins taught music and made instruments in it for many years.

Schweikher considers it was not until the construction of a house for himself in 1938 that he developed an idiom he felt was his own. It was in wood, Douglas fir for the structure and redwood for the cladding on a post and beam system, with pintles and dowels as connectors in place of nails. It led to the use of standard, mill-run lumber, and to an appearance sometimes described as 'stick architecture'.

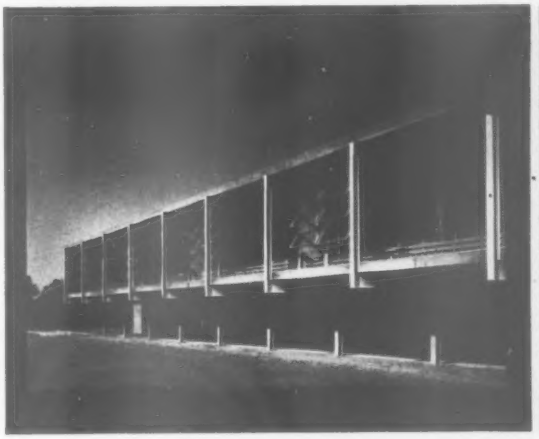
The office of two assistants was joined by a partner, Ted Lamb, in 1936, and in 1938 by another partner, Winston Elting. It closed during the war, when Lamb was killed, and re-opened after as Schweikher and Elting, with Elting as administrative partner. In 1953 Schweikher went to Yale as chairman of the Department of Architecture and in 1955 to Pittsburgh as head of the Department of Architec-

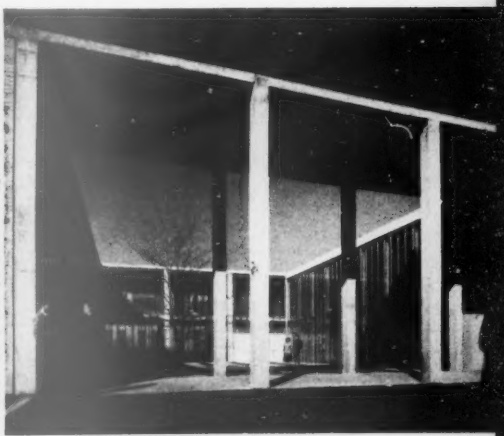


Paul Schweikher's architecture has developed in a personal manner, which he first felt was truly his own in the house he built at Roselle, Ill., for himself in 1938. There—as is seen in the living-room, left, and master bedroom, right—heavy emphasis was laid on materials and structural methods. The same qualities appear nearly a decade

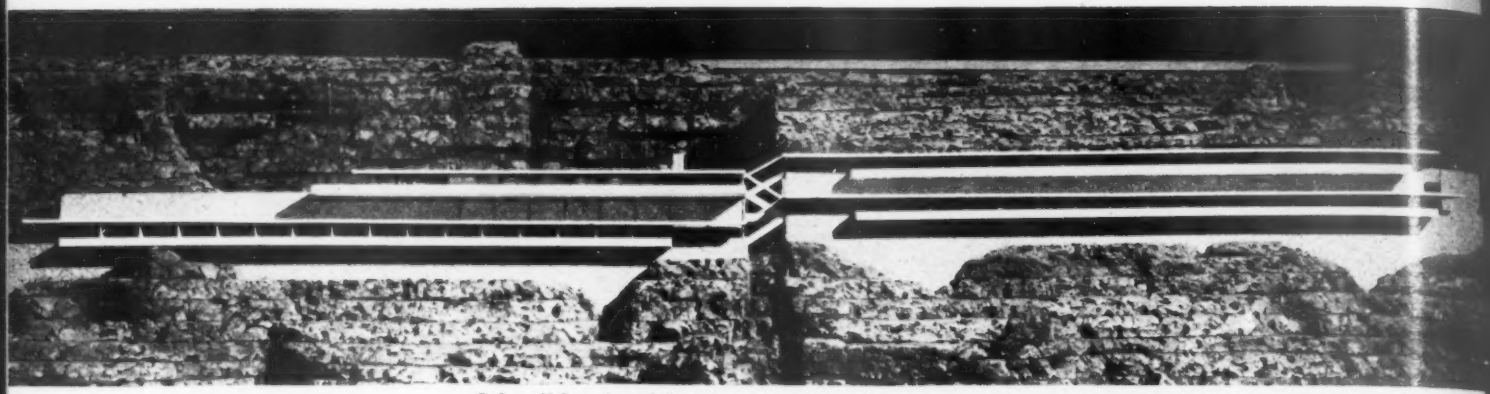


later in the Upton House, whose cactus garden is seen at left, and patio shelter at right, but raised there to an almost Wrightian pitch, as befits a building near Taliesin West (the house is at Scottsdale, Ariz.) and built by the same contractor. But by 1950 these qualities had begun to develop in another way and the Fine Arts Centre at Maryville,





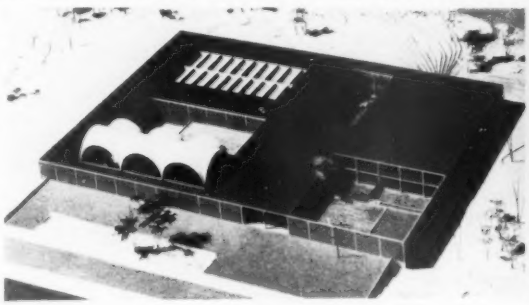
Tenn., using different materials and housing different functions, tends towards almost Brutalist treatment in the classroom wing, left. Later work in Maryville, however, such as the chapel-theatre group, right, shows a more formal tendency which has been maintained since, even in the exotic Peruvian hill-side site which appears over the page.

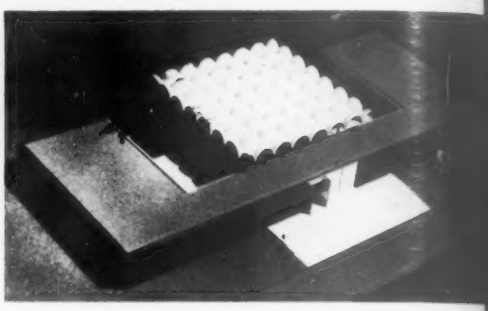


Schweikher (cont.) *Above, Paul Schweikher's project for a terraced hotel on the ancient Inca site of Machu Picchu. Below, two of his most recent projects for semi-public buildings; the Grace Lutheran Church, Teaneck, NJ, left, and the Language Centre for Vassar College, Poughkeepsie, NY.*

ture of the Carnegie Institute of Technology. Since 1953, Schweikher has practised by himself, first in New Haven and now in Pittsburgh, working in various places under separate agreements with associates, including his former partner Elting.

His admirations are Mies and Le Corbusier (architecture), Klee and Mondrian (painting), Arp (sculpture). The painter Josef Albers, and Mies, have influenced him as much in their talk as their work, and both are his good friends.





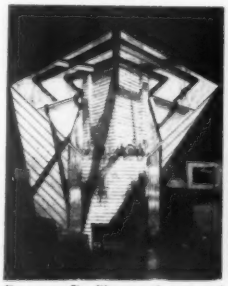
52

Bartlesville, Oklahoma

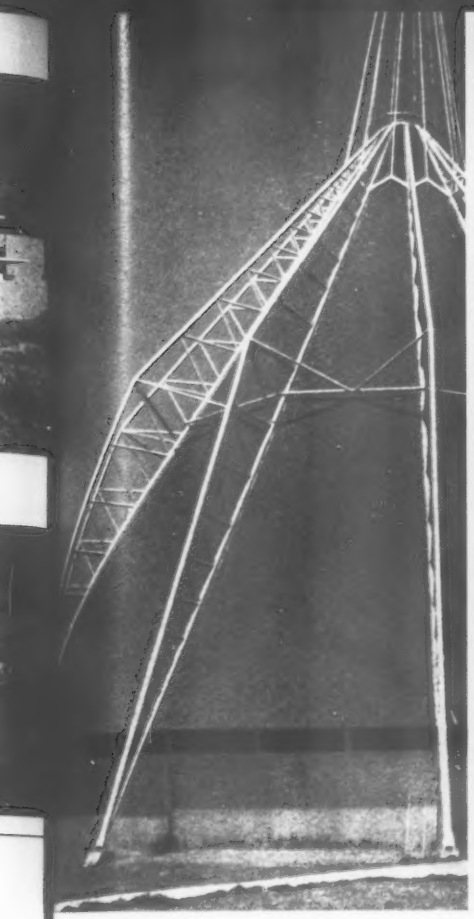
Bruce Goff, born in 1904, is often regarded as the most hundred-per-cent American of US architects, even though he has never rated inclusion in the Museum of Modern Art's *Built in USA* series. Though a native of Kansas he has made his mark mostly in the heartland states, and particularly in Oklahoma. His family settled in Tulsa while he was still at school, and he began his architectural practice (and training) there at the precocious age of twelve in the office of Rush, Endacott and Rush. The middle partner, an engineer, gave him encouragement, and advice of the order of '. . . the way you're headed, you better get an iron helmet, because you're going to be in No-man's land all your life.' The prognosis was correct; he has remained unclassifiable all his working life, but he has protected himself against the sniping of the classified by personal charm, not a tin hat.

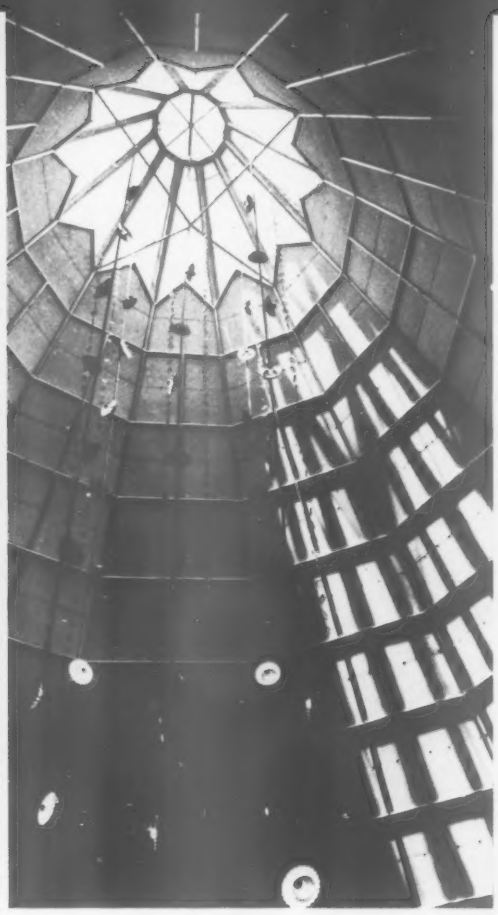
Without formal academic training, he has nevertheless given much time and thought to teaching, first in Chicago in the 'thirties, and—more memorably—at the University of Oklahoma since the War, where his effect on architectural thought and campus life appears to have been galvanic. This post he has now resigned in order to devote himself fully to his practice, now located in the Price Tower, Bartlesville, a work of his life-long admiration, Frank Lloyd Wright. Though he maintains a branch office in Norman, Okla., he has no partners, few assistants; his manner of working, like his manner of thinking, is personal and individual. His work of the 'thirties caused him to be regarded as a follower of Wright, but his following is at the conceptual, rather than formal, level—it is the idea of an organic architecture that they have in common, and it is clear that Goff's views on the use of materials, like his tastes in the other arts, are catholic, not exclusive. He is a master in the use of 'as found' materials—for instance, the outer trusses of salvaged oil-drill piping of his tepee-shaped Hopewell Church (*top left, facing page*).

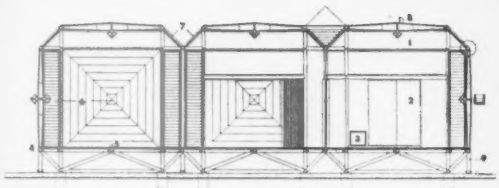
Like Wright, he admits influence from exotic cultures, as well as from music. Unlike Wright (and unlike most other architects as well), he claims a consumer-oriented attitude to design, which justifies itself in works like the Aurora house, which swoops much nearer to the popular conception of a dream-house than most architects could go without courting disaster. Hostile criticism (which has never been in short supply) calls him vulgar, over-romantic, 'ill-controlled' in design. The romantic streak, like the alleged vulgarity, is part of the consumer orientation and he is a stout defender of the American people's rights to sentiment and even sentimentality—it enables him to communicate where more restrained designers cannot, to pioneer modern architecture in staid communities that might never have been persuaded by reticence and European good taste. As to the lack of control, that is a criticism that must fade as anti-formal art movements like Action Painting gain in power; his concept of Interspatial Composition, largely derived, it would seem, from the music of Debussy, 'designed in the continuous present, without dominant routes, but with all parts indissolubly related,' dates from almost the same months as Jackson Pollock's prime ventures into aformal composition and dribbled paint.



Bruce Goff's early work of the 'thirties and 'forties gives tangible evidence of his admiration for Wright—above are the fireplaces and exterior of his 1940 Unseth House at Park Ridge, Ill., and at right the living-side of the Colmorgan House at Glenview, Ill., of 1937.



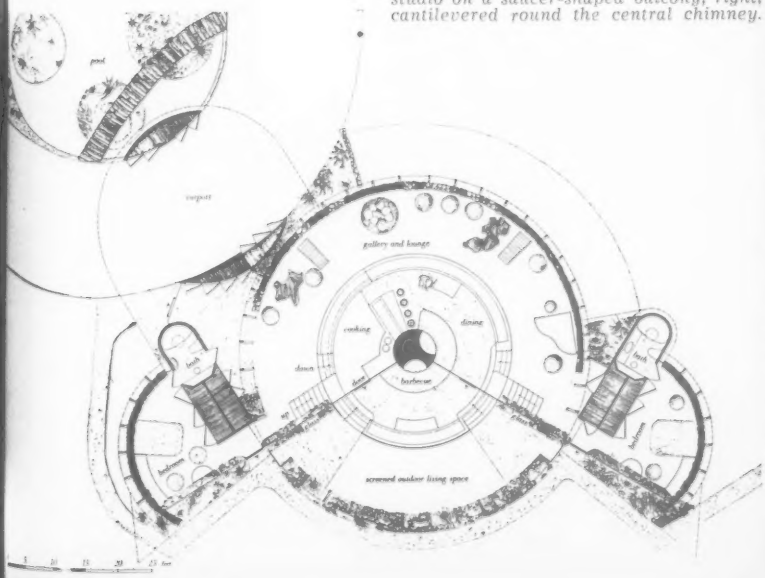




Goff (cont.) *Goff has made unconventional use of tubular structures from time to time, to suspend the roof of Hopewell Baptist Church tent-wise, left and centre, in 1953, or to form spacially complex joins between cubic volumes, above and below, in an experimental house in Florida a year earlier.*

The most original, most noticed and most characteristic of Bruce Goff's dream-houses is the Ford studio-house (1950) at Aurora, Ill., below, built largely of

Quonsett frames on a plan made of segments of circles, below, with the studio on a saucer-shaped balcony, right, cantilevered round the central chimney.

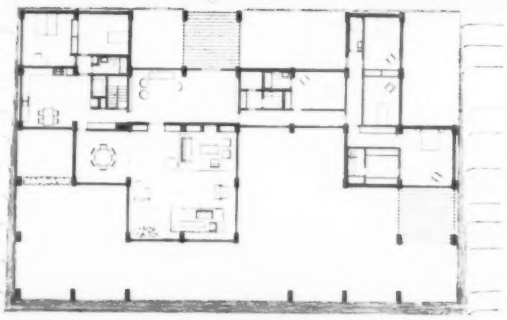


50

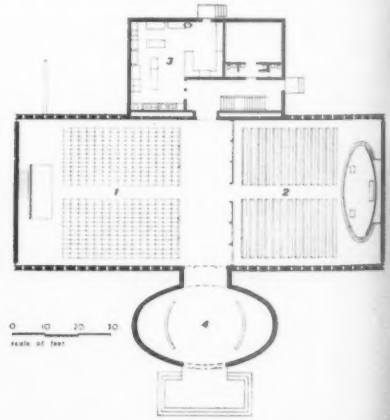
New York City

Philip Johnson's unusual and much-commented position in American architecture seems not to be due to any accident of birth, which took place on July 8, 1906, in Cleveland, Ohio, in an apparently inartistic family — his father was a lawyer. As late as 1928 he was still not oriented towards architecture, but was reading classics at Harvard. In that year, however, an article by Henry-Russell Hitchcock not only diverted his attention to the Modern Movement in architecture, but also led to a partnership that eventually produced the book, and the phrase, *The International Style*. He did not immediately take up architecture as a profession, but spent the 'thirties doing an inestimable job of propaganda for Modern Architecture from the Museum of Modern Art. His regular architectural studies were done at Harvard in the early 'forties, very much influenced by Marcel Breuer, who was still on the Harvard staff at that time. His prime admiration remained Mies van der Rohe, whom he had first met in 1930, in spite of his wide and varied experience of other architects and their work, and his own style has developed from securely Miesian beginnings, though it has lately incorporated domical and vaulted forms—as in the Port Chester synagogue—that lie outside any Miesian formal language, and derive more from his immense scholarly knowledge of the history of architecture.

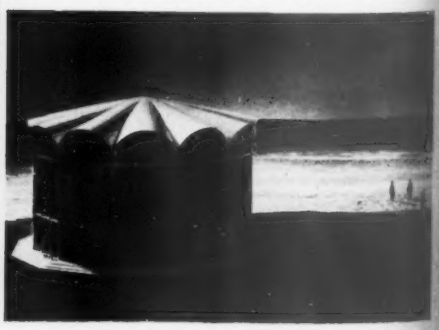
Nevertheless, his most conspicuous building in course of erection, the bronze-clad Seagram tower, is purely in the manner of his first master, with whom he is associated in the design. For this project, Johnson and Mies share an office in New York, but his original base was his own office in New Canaan, where he lives in his famous, and Miesian, glass house. His connection with the Museum of Modern Art has by no means withered away, and he has added an annexe at one end of Ed Stone's street façade, as well as a sculpture garden at the back, designed with a sympathy for the exhibits that comes from a real eye for sculpture—his current favourites being Giacometti, Lassaw and Roszak. In spite of his interest in vaulted forms and in Antoni Gaudi, he is sceptical of the present 'structural complex' and unimpressed by the possibilities of hyperbolic paraboloids.



Above, the Boissonas house, just completed at New Canaan, Connecticut, and constructed of brick piers on a square grid (plan left), linked to the landscape by pergolas. A basement below the two-storey living pavilion houses an organ; the sound enters the living-room through a grating in the floor. Below, plan, facing page, interior and exteriors, of a synagogue at Port Chester, New York, 1956. The structure is exposed steel, filled with white stone blocks framing narrow stained glass windows. The velarium-like ceiling is of plaster. Plan key: 1, social hall; 2, sanctuary; 3, kitchen; 4, foyer.



Left and below, a projected beach house, Cuba.



49

Los Angeles, California

Robert E. Alexander partner to Richard Neutra, was born in Bayonne, New Jersey, in 1907. He studied at Cornell University from 1925 to 1930, where all was dedication to the Beaux Arts system. His thesis design was a non-denominational Temple in New York.

After a visit to Europe and work in a California office the depression came and jobs varied from coaching football to day-labouring on construction projects. This shake-up led to a revived interest in town planning and an extensive self-planned course of reading through Le Corbusier, Neutra, Ebenezer Howard, Geddes, Unwin, Mumford and Clarence Stein. Finally he had the chance of working on the Metropolitan Life Insurance Company's Parkchester development, and was one of the architect partners who developed the design of Baldwin Hills Village, Los Angeles, a model suburban development within the world's largest unplanned suburban spread.

During the war Alexander worked in the Lockheed Aircraft Corporation, not on the design, but on the manufacturing side. This was followed by a commission to build an experimental laboratory school for the University of California. Later he went to India as a consultant on planning for UNESCO. Work was centred in Madras, where Alexander drew up proposals for a Rural City. In 1949 he joined forces with Richard Neutra.

Above, Speech Arts Building at Orange Coast College, by Neutra and Alexander.

Above, entrance to the student centre at Orange Coast College by Robert Alexander.

49

Tiburon, California

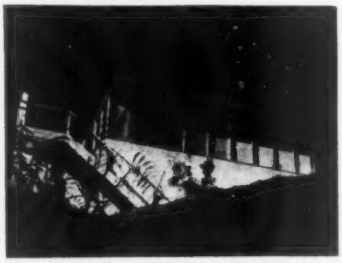
Rafael Soriano was born on the island of Rhodes in 1907 and, except for four years in Asia Minor, spent all of his childhood there. Soriano's education was in the hands (sometimes literally) of his father, the subjects taught being French, the violin and Greek, all accelerated by the use of the stick.

At seventeen he ran away from home and went to America and, at twenty, entered the school of Architecture of the University of Southern California, paying his way by working at night and during weekends at a fruit stall.

In his first year he was advised by the Dean of the School to quit architecture and buy a fruit stall of his own, because he had no talent.

As a result of this early advice his architectural education took place in complete isolation, but the friendship and vision of Dr. Belle, Professor of French Literature at the University, gave him courage, and most of all he found inspiration in the structural lucidities of the music of Bach and the Spanish Flamenco.

Community Centre on a sloping site at Los Angeles, 1937.



House at Los Angeles, 1937; wood frame on a module determined by standard steel sashes.

He gained his Bachelor Architecture degree in 1934, and followed it up with a short period in Richard Neutra's office. He landed his first commission as a result of going to a French film and finding himself explaining the point of the jokes to a lady in the row behind. Several months later he was invited by the lady and her daughter to a party to meet a cousin who was a concert pianist, and this led to the commission to build a house round her Bechstein grand. The house was chosen as one of three or four to be shown in the American section of the 1937 Paris exhibition, and the calls began to come in.

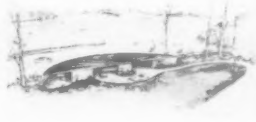
The Dean of his old architectural school, who had once advised him to buy a fruit stall, wrote 'Good boy, Soriano, we knew you could do it.'

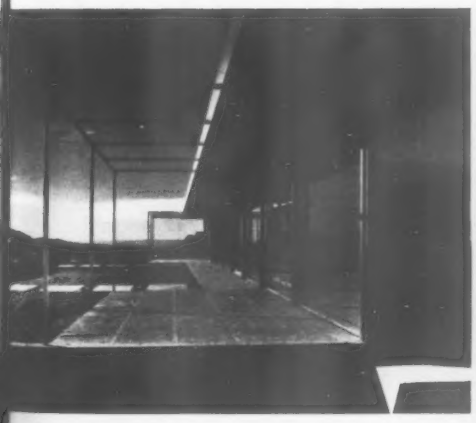
In 1953 Soriano moved from Los Angeles to a houseboat at Tiburon, a small quayside town with a magnificent view across the bay to San Francisco. His office staff fluctuates between two and eight, the two permanent assistants are Gerald Weisbach and Bill von Lockum.

Nursery garden by a highway. Hallawell Seed Co., San Francisco, 1940.

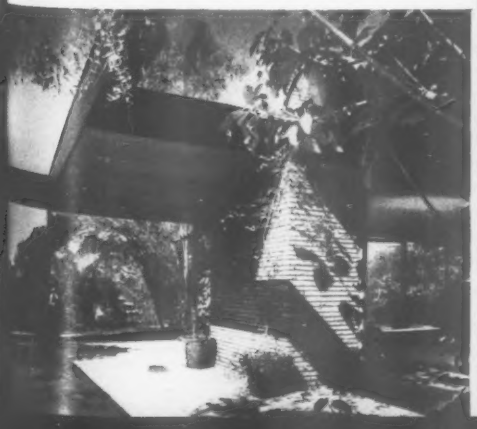
Van Nuys house, California, 1946; light steel frame of posts and lattice girders.

Soriano (cont). *Above, multiple dwelling at Los Angeles, 1951. The frame is steel, and cupboards are used as room dividers to allow flexibility in replanning; above left, internal courtyard; left, detail of balcony. The building illustrates Soriano's sensitive use of the light steel frame filled with glass and semi-transparent materials. Right, prototype of a small steel house (1,000 sq. ft.) designed for mass production. Below, house on a steeply sloping site, using precast and prestressed concrete.*





Above, Shulman house, Los Angeles, 1949; main structural members are steel and secondary ones are wood. Above right, Curtis house, Los Angeles, 1949; steel frame with a steel deck roof. Below and right, house built in 1950 to structural module of 10 ft. by 40 ft. to allow for maximum flexibility in planning; because of the Korean war wood joists had to be substituted for metal between the main steel members.



The firm employs consultants in each of the allied professions and has an independent association with four firms in Los Angeles known as project architects, who supervise the work on large jobs.

Soriano believes that it is from the scientific root that architecture should draw its real nourishment today. Painting and sculpture he considers as ritualistic manifestations that may have a place in the life of some men, but he doesn't see the connection between such obscure and irrelevant myth-making and the armature of architectural discipline and creation. Architecture, he thinks, must start from a performing principle—active like the motor or the heart—and not a bas-relief of a motor or a heart.

He is amazed today at the growing tendency to sugar-coat structure, to cloud objectivity with the irrelevances of personality-mongering. 'I cannot find,' he says, 'a single statement by scientists about the applied decoration of cells or electrons, or how to give a sculptural flavour to the jet engine. The architect should be concerned, like the scientist, not with pictures but with principles; it is through these that he will make himself intelligible to others. Architecture will be better served by a clear mind than by a complex personality struggling to express itself at all costs (usually the client's).'

It's no use trying to escape through magic notations like 'standardized' and 'organic' as if we were sitting on the sand drawing a coiled serpent, waiting for the medicine man to come.

49

Berkeley, California

Vernon De Mars, born in San Francisco in 1908, is rare among US architects in having more or less the turn of mind and the reputation that a European housing-specialist might have. He arrived at this by entering Government service (after some years of variously directed activity preceded by study at the University of California) to design emergency camps and temporary accommodation for migratory labour in the *Grapes of Wrath* epoch in California. The upshot was a resolve to rectify the complete absence of any American contribution to either the architecture or the sociology of housing, and its realization were the adobe-walled row-houses at Chandler, Arizona, that have found their way into every text-book, and the collective subconscious of the Modern Movement. Much of De Mars' work since then has also been in public finance housing, but he and his office also design rental housing, and have made inroads into the merchant-building housing field, as well as community planning work. He is fairly heavily committed to a preference for row-houses as against land-wasting detached units, and was also involved—with Koch, Kennedy, Rapson and Brown—in the design of the very English-looking *Eastgate Apartments* scheme of flats in Boston. By way of contrast, his own private house at Berkeley, California, where he now teaches, is free-standing and admittedly Japanese in extraction. But he does not rate Japan as a primary influence on his work—European sources account for most of that, though not for the projecting party-walls at Chandler—nor among his professed current admirations, which are directed towards Le Corbusier, Aalto, less towards Mies—and therefore a little worried by the most recent work of Arne Jacobsen, whom he otherwise admires—Nervi, Picasso, Portinari and Leger.

Below, Chandler Farms, Arizona, a community farming project of 1938 for immigrant families. Each terrace comprises eight four-room apartments; construction is of native adobe and cost per unit was $2,097, including garage. Below, De Mars' own house, built in 1951 at Berkeley, California. The frame is wood, with a module of 8 ft. by 4 ft.; external walls are redwood boards and cedar.

48

New York City

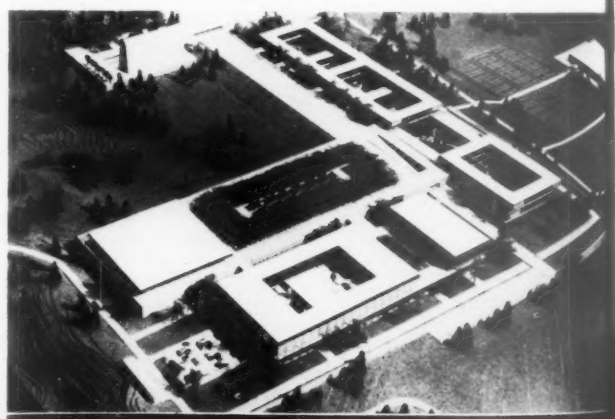
Gordon Bunshaft was born in Buffalo, New York, in 1909, and lived there until he was nineteen. As many children do he made drawings of houses, but the family doctor thought them so good he suggested that Bunshaft should be an architect. His violin teacher had two sons who were engineering students at MIT, and he decided then that he would go to MIT to study architecture. Entering MIT in 1928, he obtained a Bachelor's Degree in 1933 and the Master's Degree in 1935. On a Rotch Travelling Fellowship of $3,000 he spent eighteen months in Europe from 1935 until the Spring of 1937, and, in the autumn of that year, he joined the firm of Skidmore and Owings—Skidmore had just opened an office in New York and Owings was running a small office in Chicago. He started in the firm as a designer and, for the past twenty years, it is to design that he has devoted most of his time. He was made a partner in 1946.

In 1937, the main concern of the office was to build up a practice, and the atmosphere was extremely businesslike; this is still the order of the day, but running through it all is a determination on the part of all the members of the firm to do the best buildings they are capable of.*

During Bunshaft's time at MIT the students were going through a period of transition from Beaux Arts influence to the modern movement, the chief mentor, as in so many other schools at the time, being Le Corbusier. Gordon Bunshaft now considers Mies van der Rohe one of the greatest living architects. 'Although a German by birth, his recent buildings represent the truly great urban architecture of our country. In contrast to the foreign use of reinforced concrete, we employ steel framing as a basic structural system for most urban buildings. Mies van der Rohe's work truly expresses this fact.' Bunshaft's most admired painters are Leger, Miro, Picasso, Ben Nicholson and Mondriaan, and, for contrast, Dubuffet. Among sculptors he singles out Brancusi, Picasso and Giacometti, with Chadwick and Noguchi as close runners-up. Artists who have done work, or are in the process of doing it, for buildings by Skidmore, Owings and Merrill are: Calder, Miro, Steinberg, Seymour Lipton, Lippold, Bertoia, Noguchi and Stuart Davis.

Bunshaft answered, along with a number of other American architects when they were asked the same question, that stylistic cleavages in contemporary American architecture are more apparent between building types than between

Below, model of final design for the US Air Force Academy, in course of construction, 7 miles north of Colorado Springs, 6,500 feet above sea level. The structure is based on a 3 ft. 6 in. module; facing materials will include marble, granite, travertine, and native stone. Bottom, Connecticut General Life Insurance offices, Bloomfield, Connecticut. The structure is exposed steel columns and the curtain wall heat- and glare-absorbent glass and porcelain enamel spandrels, all flush. Four large interior gardens are sunk into the main wing; areas within the building are divided by brightly coloured acoustical screens.



*Skidmore, Owings and Merrill have four offices—New York, Chicago, San Francisco and Portland, Oregon. There are twelve general partners, five in New York, four in Chicago and three in San Francisco. There are 17 associate partners, divided among the offices. The total staff is approximately 900. Also, in the New York, San Francisco and Portland offices they employ consulting structural and mechanical engineers as well as consultants in acoustics, lighting and other specialized fields. In the Chicago office there is a complete staff of structural and mechanical engineers. (For a description of the office organization see A.R., Feb., 1956.)

Bunshaft (cont.) *Above, the Manufacturers Trust Bank, New York. The first floor glass panels are 22 ft. by 9 ft. 8 in. Ceilings of thin corrugated plastic are supported on aluminium Ts under a field of cold cathode tubes; their flow eliminates the surface reflection of the curtain walls. Below, Harry Bertoia's gilded steel sculptural wall in the main counting hall. Right, projected 41-storey office block on Park Avenue for Union Carbide, due to be finished in 1958. Bottom, piazza and lower floors of the projected 60-floor Chase Manhattan Bank.*

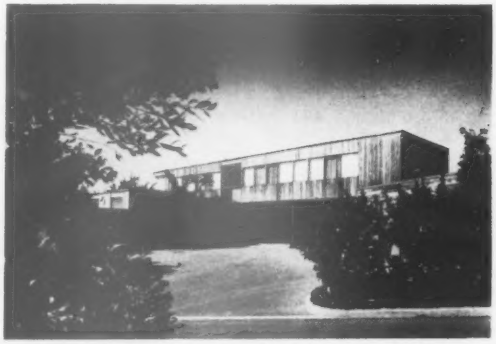
regions. In the domestic field he sees a certain differentiation from place to place, but he lays this at the door of certain strong personalities working in those regions, producing what he calls 'charm school' designs, as opposed to the more disciplined standards of the 'international' style.

In a discussion between Bunshaft, Saarinen and Philip Johnson, described by Mrs. Saarinen, Bunshaft 'defended the need for a common style, the necessity of a vernacular', and in the work for which he has been directly responsible—Lever House, the Manufacturers Trust and Connecticut General Life Insurance buildings—he has done as much as anyone in America to promote an architectural vernacular of today.

48

Los Angeles, California

John Rex, of the firm of Honnold and Rex, was born in Los Angeles in 1909, and studied architecture at the University of Southern California from 1927-1932. The office has a total staff of eleven and does work of all kinds, ranging from a few thousand to a few million dollars. Rex's admirations are (painters) Rico Lebrun and the late Orozco of Mexico; (sculptors) Noguchi, Rosenthal



Anderson house, Los Angeles; it is a steel frame structure with external facing of natural redwood.

and Bertoia. 'In my twenty-three years experience of architecture', Rex says, 'I have concluded the only really "organic" architecture is the cave—

despite the exaltations of some architects. The tendency, since the first Egyptian architect accepted a commission, has been a progression towards standardization.'

Above, Westchester Junior High School, for 2,500 students, completed in 1952. Below, Robbins house, Beverly Hills, California, seen from the paved terrace outside the living area; it is of frame construction with redwood finish.

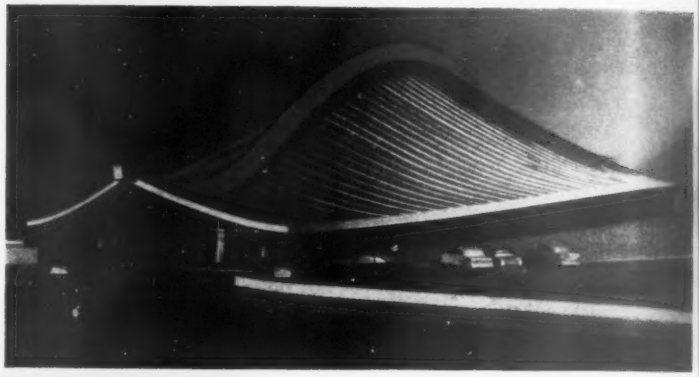
46

Bloomfield Hills, Michigan

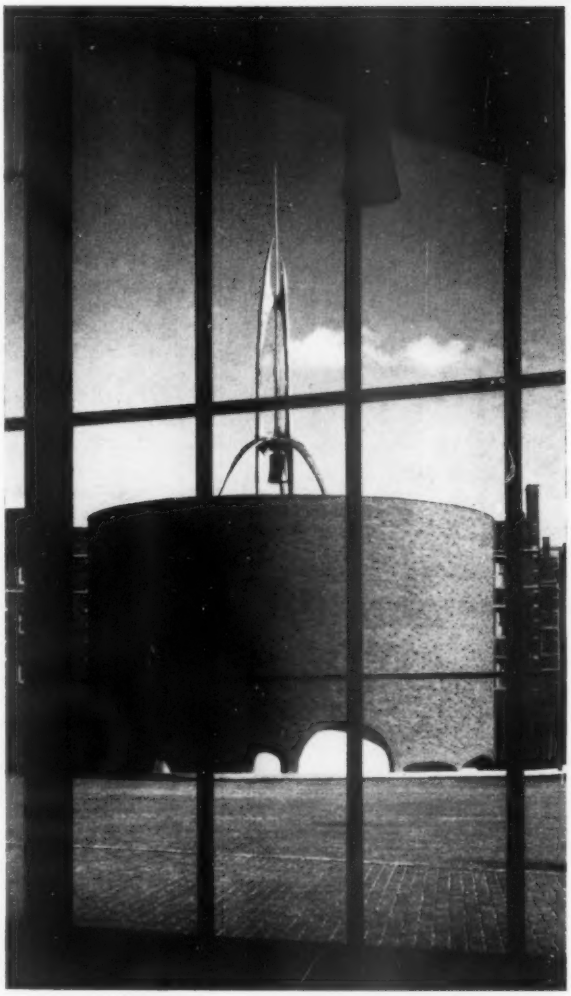
Eero Saarinen, famous son of a famous father, was born in Finland in 1910, and raised there and in the US, crossing the Atlantic when his father went to Cranbrook Academy in 1923—one of the first important inroads made by a European architect on the American scene since Colonial times. Cranbrook's forward-looking, if slightly arty atmosphere, combined with the family tradition of architecture—two uncles also practised, besides his father—and an infancy spent largely in the family drawing office, seem to have left him little choice as to career, and 'by the time I was 8 or 10 I thought pretty much that I was going to be an architect.' Nevertheless, he spent a year studying sculpture in Paris before settling to an architectural training (at Yale) and has always made notably sympathetic use of painters and sculptors in his designs, especially sculptors — Bertoia, Calder, Pevsner, Roszak. He received his first commission at 25, as his father's stand-in, and has progressed from the paternal office to having one of his own, but still in the Cranbrook country—at Bloomfield Hills, Michigan—where he maintains a sizable office, with two partners, Joseph N. Lacy and John Dinkeloo, and nearly fifty assistants.

His present position in US architecture defies classification, but not in the usual sort of way. His great scheme for General Motors Technical Centre, with its endless grids of standardized glazing, earned him the reputation of a leading Miesian, along with Bunshaft and Johnson, but, while admitting influence from Mies, he suggests that the building of his which shows this influence most strongly is the three-point dome he designed for the MIT campus, on the grounds that he there achieved his greatest space/structure synthesis. His tendency, it is clear, is to design for character, to dramatize, to make of each building something special. Thus GM Tech Centre was seen as 'an exalted industrial product,' the circular brick chapel at MIT as a place of 'repose,' the dome there as a statement of 'technical audacity.' It is an approach that confutes critics and—occasionally—confuses students, but it also means that the Saarinen office is something of an architectural laboratory where new ideas and new forms are constantly under development as well as discussion—the most recent being the Georgian-flavoured grid façades of the US Embassy in London, the ship-turned-turtle roof of the Yale Hockey Rink, and the Latin-American looking blocks for the Milwaukee Memorial Centre. He says that contemporary architecture is word-poor—his work, as much as anyone's, is attempting to 'enlarge its alphabet beyond ABC.'

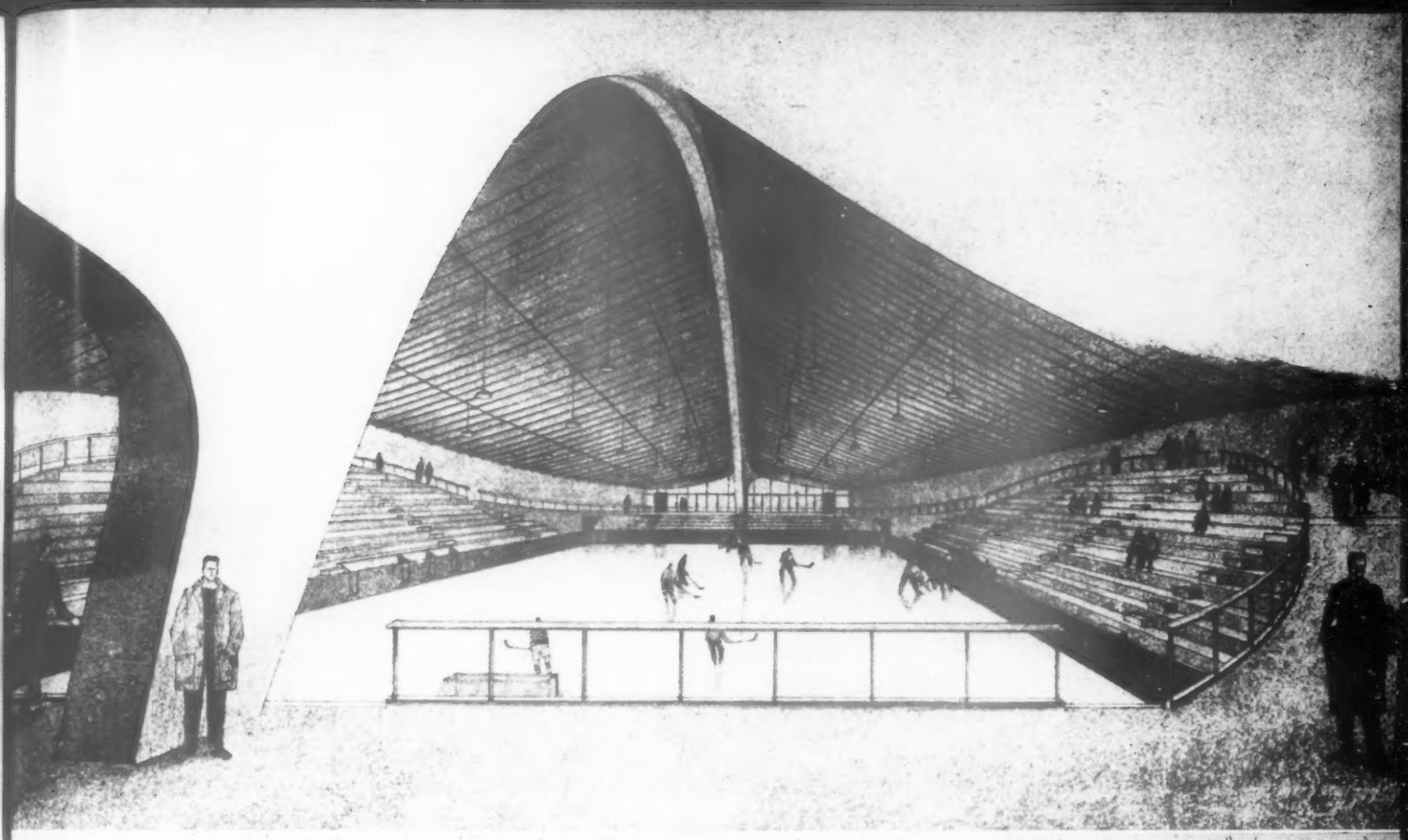
Eero Saarinen's reputation as a Miesian, bred by GM Technical Centre, has tended to obscure his great abilities in the management of curved and arcuate forms—abilities that first clearly manifested themselves in the giant arch on the bank of the Missouri at St. Louis for the Jefferson Memorial project, designed just after the War.

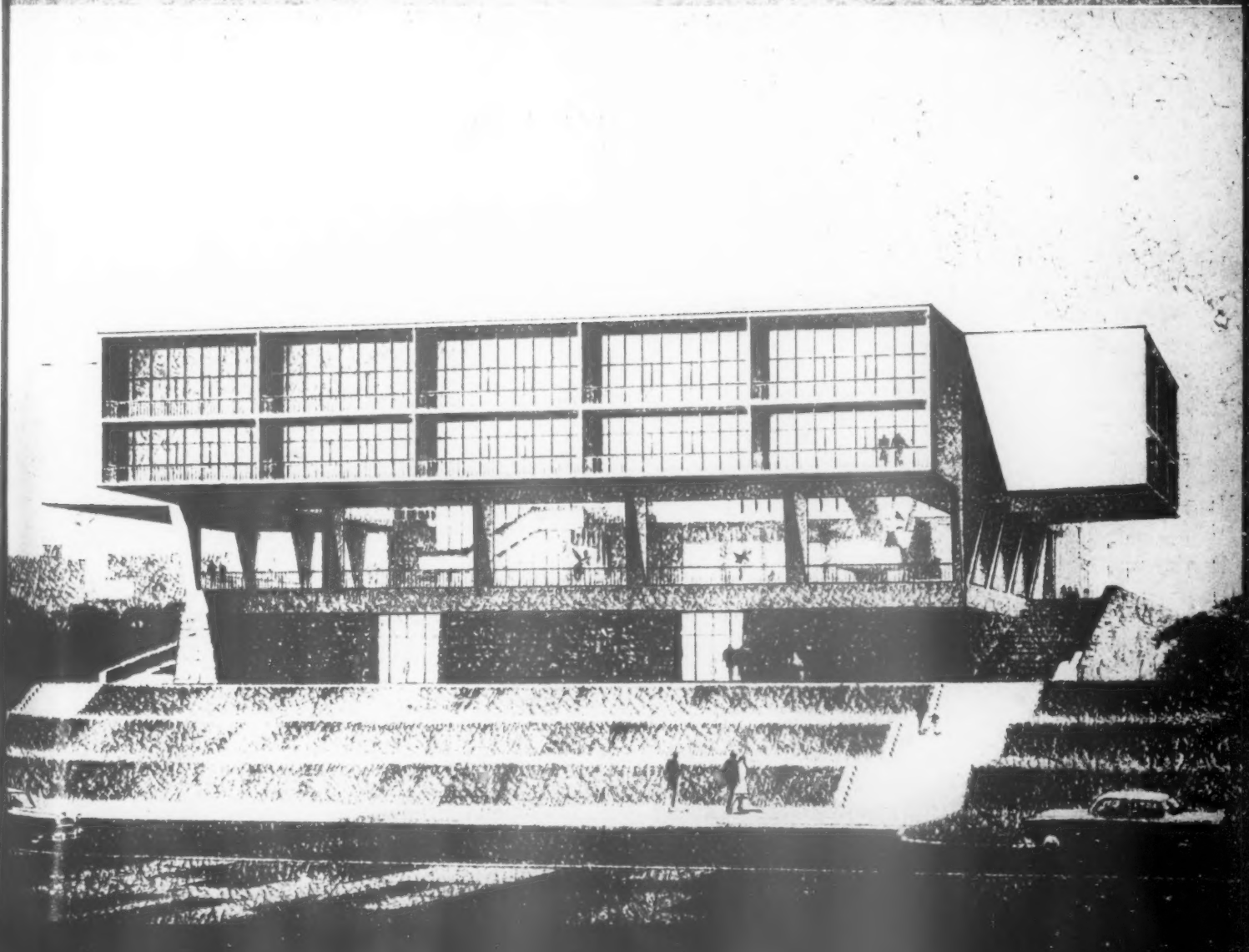


Quite the most remarkable of Saarinen's projects for large curved vaults is the David S. Ingalls hockey rink for Yale University, right and opposite top, a giant multi-curved shell depending from a keel-like arch that recurves upwards at each end to provide entrance canopies.



The design of comprehensive schemes for cultural activities, involving the grouping of different buildings and the incorporation of work by painters and sculptors, has been an increasing activity of the Saarinen office. At the left is a view from the foyer of the auditorium at MIT, towards the chapel, with its campanile by Theodore Roszak, the sculptor, while below and opposite, bottom, the Milwaukee Memorial Centre, Milwaukee, Wis., is seen in model and rendering.





46

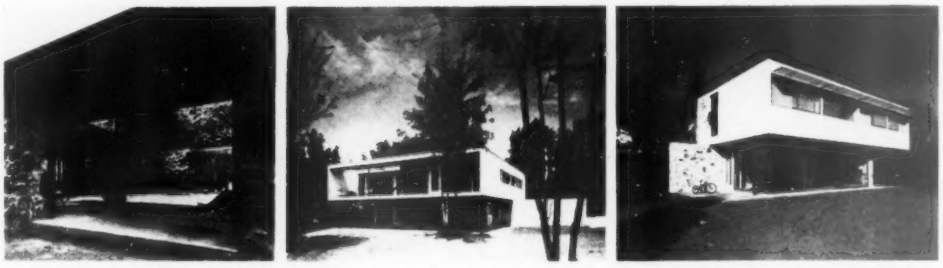
New Canaan, Connecticut

Eliot Noyes was born in Boston in 1910, lived in Colorado until the age of seven, and then moved to Cambridge, Mass., where his father taught English at Harvard; his mother was an expert pianist. In his 'teens he thought of becoming a painter, but at the age of nineteen decided on architecture. When he began at the Harvard Graduate School of Architecture, it was entirely under the sway of the Beaux Arts system; but Noyes discovered Le Corbusier in the library and was swept away; next he found a catalogue of the Bauhaus and thought of transferring to Dessau, but it was in 1933 and the idea was impractical, so he stayed, discontentedly, at Harvard. In his third year he left for Iran on an archaeological expedition, returning to find Gropius and Breuer at Harvard, and with them a new spirit. After graduation he was, for a time, Director of the Department of Industrial Design at the Museum of Modern Art, and organized the furniture competition won by Saarinen and Eames with, to date, the most widely copied chair of the twentieth century.

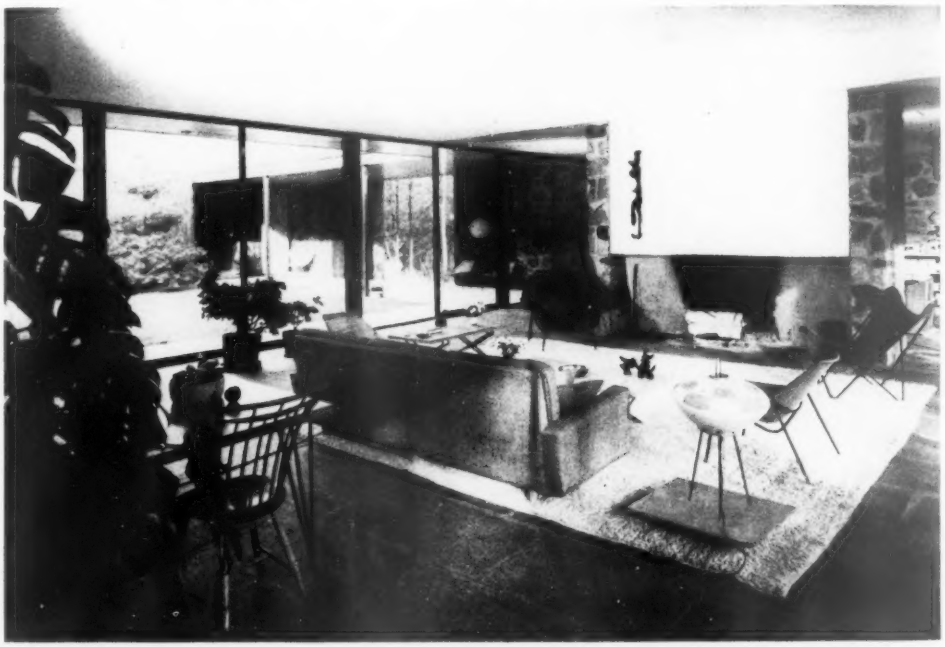
After the war, he joined Norman Bel Geddes and Co. as an industrial designer, and two years later set up his own office which, after ten years' working, still successfully combines architecture with industrial design (see above). There are two associates and a staff of between twenty and twenty-five. His admirations are (architects) Corbusier, Mies, Wright, Saarinen, Yamasaki, Breuer, Eames, Nervi, Peressutti; (sculptors) Lipschitz, Calder, Nivola, Moore, Butler, Chadwick, Noguchi, Bertoia; (painters) Klee, Picasso, Miro, Braque, Matisse and many others.

Noyes thinks there is still a valid source of regional difference in US architecture deriving from the influences of climate and materials and expressed in the skin rather than the structure, and he believes that sensitive designers will inevitably reflect this according to the region in which they build. The urge to experiment with and invent new structures is, he believes, a basic and valid one, but it must find its proper place in relation to the other aspects of an architect's work.

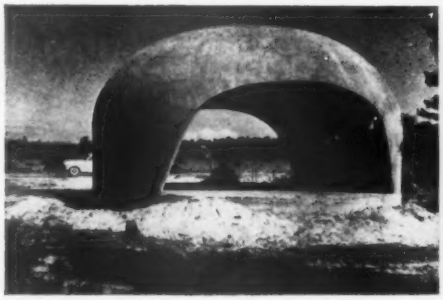
Eliot Noyes works as both architect and product-stylist for International Business Machines; above is the laboratory he designed for them at Poughkeepsie, NY, and inset in text an electric typewriter.

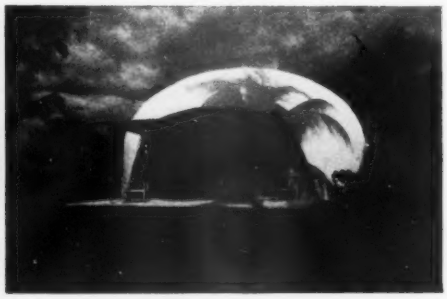


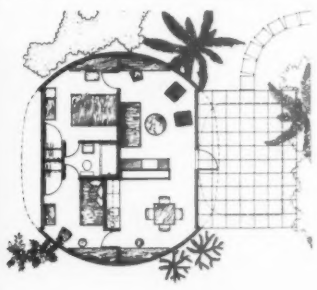
Noyes also maintains a lively practice in the domestic field; his own house is seen at left and below, the Bremer House also in New Canaan, Conn., centre; the Bareiss house, Greenwich, Conn., right.



Quite unlike Noyes' other houses are the two at Hobe Sound, Fla., built on Wallace Neff's Airform principle, in which concrete is sprayed over an inflated balloon to form a simple domed shell, below, left, which is then glazed in and partitioned, centre and right below, to form a habitable environment.







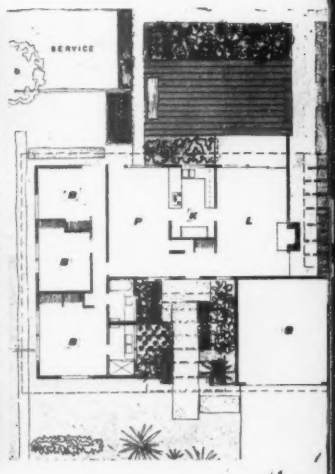
Wayne Williams Whitney Smith.

46

Pasadena, California

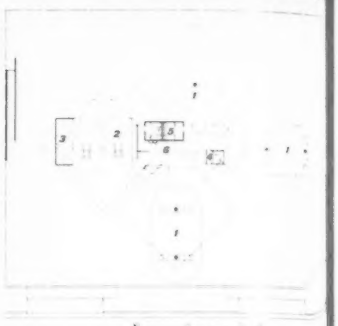
Whitney Smith was born in Pasadena, California, in 1911; an architect uncle from Texas started him on his career by giving him a tee square for Christmas. He worked his way through the University of California by playing in a dance orchestra and graduated in 1934. The first job, along with other 'depression' graduates, was under Joseph Weston in the Farm Security Administration. His partner, Wayne Williams, was born in Los Angeles in 1919, and also studied at the University of California, graduating in 1942; his war years were partly spent designing hangars and military buildings and he joined Whitney Smith's office in 1946, becoming a partner in 1949. There is a total staff of nine in a converted suburban house (see above) in Pasadena, and work ranges over a wide variety of building types.

Top left, the suburban house in Pasadena, before conversion into an office by Smith and Williams; top right and above left and right: the house after conversion; the porch and front garden have been transformed with a platform, screen wall and lath pergola into a space where conferences can be held in the open air. Extreme left, religious education building for the Pasadena neighbourhood church: the roof structure is a diamond-shaped timber truss supported on vertical posts which extend through two floors and act as mullions to sliding glass walls. Left, Booth house, Beverly Hills, California; sliding glass doors open from the living-dining pavilion on to decks over a ravine; the four-fold ceiling is of hardwood-veneered plywood.



Right, street façade and plan of a typical house (one of three variants) in a 400-house estate at Anaheim, California; prices range between $15,000 and $20,000. The house is built round a courtyard garden which forms the entrance; the living-room has two terraces, one for sun and one for shade; P on the plan, indicates the 'family' or play area and it includes a breakfast-bar built into one wall of the kitchen.

Smith (cont.) *Right and below, two views of a standardized motor service station, designed to provide a background to advertising and selling devices; the structure is a 40-ft. square roof suspended 16 ft. above the ground from a central mast. All parts of the steel framework are identical and easily replaced, and all other stations will be multiples of the 40-ft. unit. Petrol pumps are suspended from the Mobilgas advertising beam (see right). Colours, lettering, lighting and floor surfaces have all been carefully related in the design. Plan key: 1, pump islands; 2, lubritorium; 3, lubrication store; 4, office; 5, lavatories; 6, pedestrian area.*

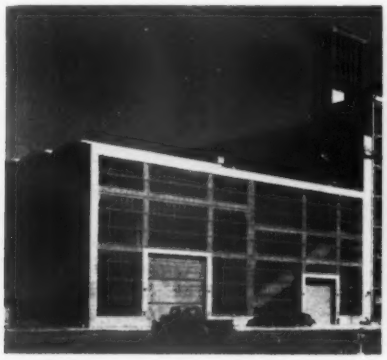


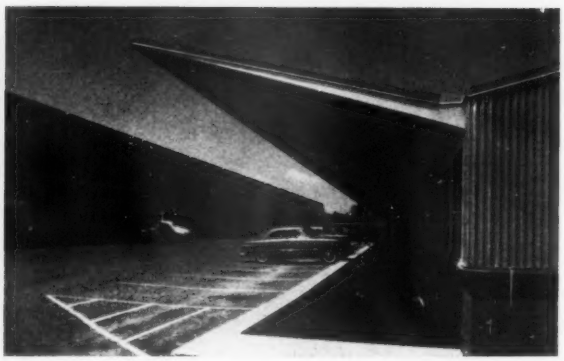
45

Palo Alto, California

Ernest J. Kump, born in California in 1911, and brought up in a family architectural tradition, trained at the University of California and at Harvard. Though he has publicly expressed his faith in the ability of standardisation and industrialisation to lower costs and make for a better general standard of architecture, his work in school design—on which his reputation mostly depends—shows constant revision of details from one project to the next. His office has also produced a town hall (at Fresno, California), naval, industrial and commercial buildings, hotels, and Embassy buildings.

Below, North Hillsborough School, California, which has a welded steel frame with timber roof framing between steel members and wood frame walls. The framing is set outside one wall, and inside the other, to give a clear external corridor space under the wide projecting eaves. Bottom left, the ordnance and optical shops in the naval shipyards, San Francisco, which won a Progressive Architecture Award in 1948. Bottom right, San Jose Technical High School, San Jose, California. It has a steel frame, and window walls are steel sash in steel plate frames.





45

Cambridge, Massachusetts

Hugh Stubbins was born in Powderly, a small town near Birmingham, Alabama, in 1912. His mother's family were direct descendants of Governor Spottswood, the first Virginia Governor, who built the original Williamsburg Palace, and his early childhood was spent on his grandfather's dairy farm—a Waldenian setting with clear, cold stream, fish ponds, pasture, fields and woods.

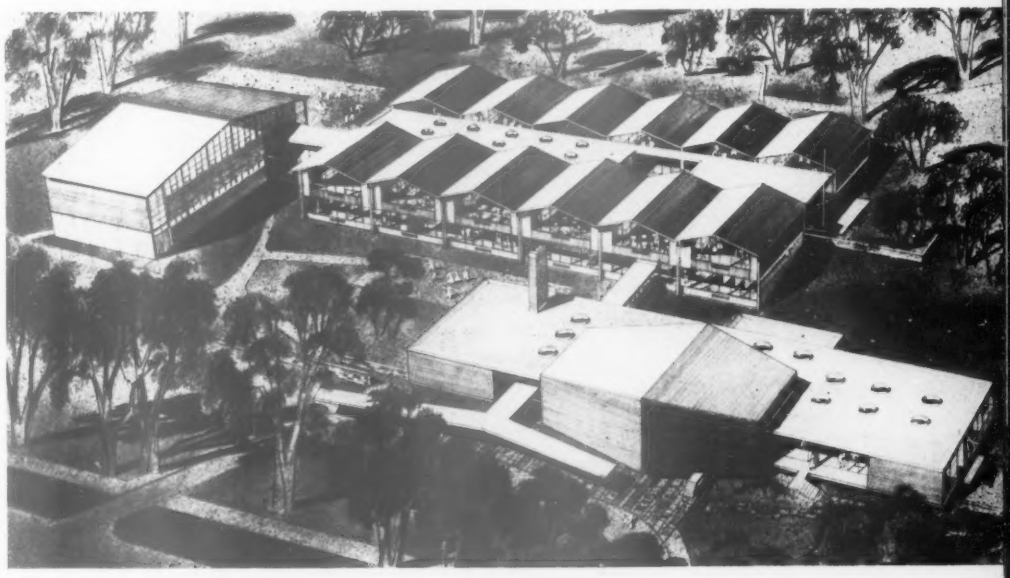
Artistic talent showed up early, but due, Stubbins thinks, to the Puritan background, he was steered towards architecture instead of painting; something he has never regretted. At sixteen, in the summer between High School and College, he went to sea as an ordinary seaman, shipping out on a small freighter to the Caribbean Islands and South America. In the autumn of 1929 he went to Atlanta and started his studies in architecture at the Georgia School of Technology, and there received a tuition scholarship for graduate study at Harvard in September, 1933. The senior professor was Prix de Rome winner, Jean Jacques Haffner, and his logic, coupled with the inspiration of Le Corbusier's books, were the chief influence on the class, though it was well aware also of Wright and Sullivan.

In 1935, at the bottom of the depression, he received his degree of Master in Architecture and started to look for a job. There were few positions open. However, Royal Barry Wills, a well-known small house architect and specialist in the New England Colonial style, had notified Harvard that he needed a young designer. Wills had a client who wanted a 'modern' house, and he felt the need for someone in his office who understood the idiom. Stubbins applied for, got the job and stayed for two years.

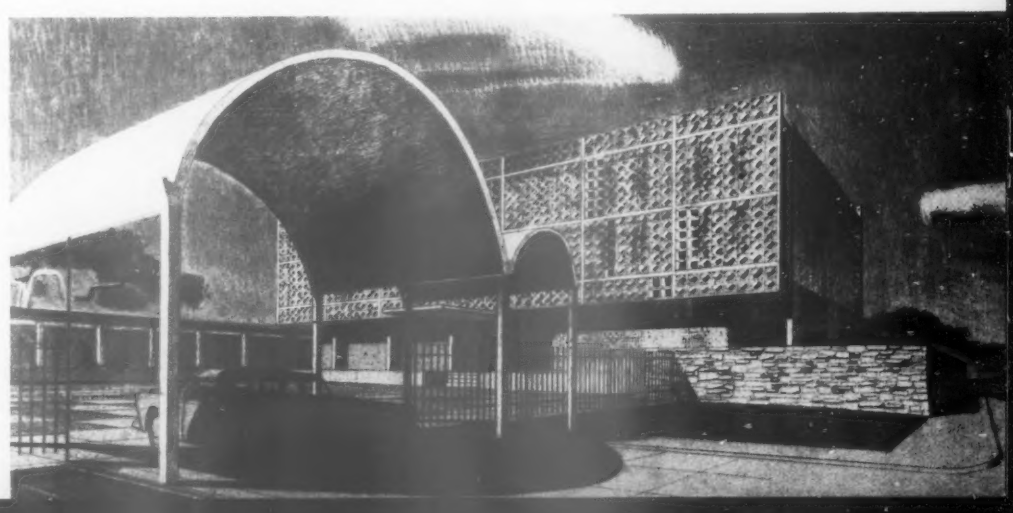
In 1939 Stubbins moved his family to Birmingham, Alabama, where he took a position as Chief Designer in the office of Miller, Martin and Lewis. Six months after, two telegrams came from Harvard; one from Gropius, whom Stubbins had never met, asking him to become his assistant in the Graduate School of Design; the other informing him he had been selected as the Wheelwright Travelling Fellow. He accepted the instructorship and moved back to Cambridge.* In 1939 James and Katherine Morrow Ford (authors of *The Modern House in America*) suggested to Stubbins that he send evidence of his work to the US Housing Authority in Washington. This led almost straight away to the commission for a Defence Housing Project, but

*The fellowship was a coveted prize carrying a large stipend with no strings, but Stubbins couldn't accept both offers, and the Fellowship was 'put on ice' for him. Later he became Chairman of the Fellowship Committee and was thus ruled out from accepting it.

Above, the Keith House, Brockton, Massachusetts, 1950. Centre, Elementary School, Brookline, Massachusetts, 1956: the block in the foreground contains an auditorium, a cafeteria and a music room; the centre block consists of 12 class roomswith administration between; the gymnasium is



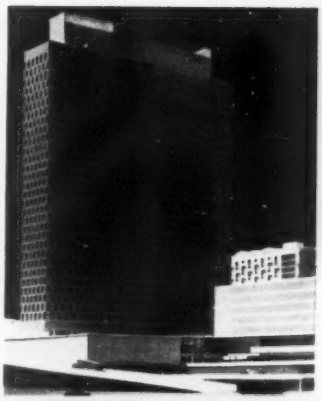
on the left. Below, proposed US Legation building, Tangier, showing the entrance court and main office block; each of the building's long elevations are shielded by glare screens of concrete.

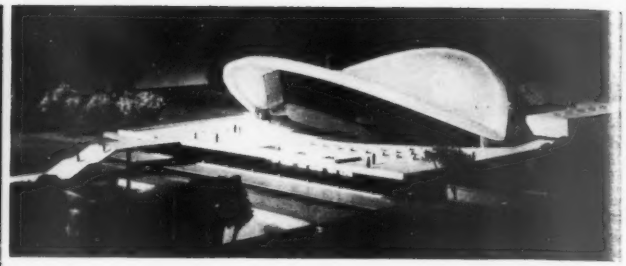


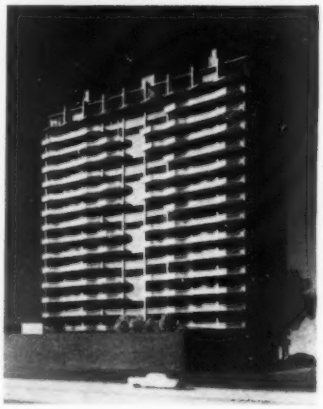
with a killing schedule; drawings and specifications had to be ready for bidding in four weeks. Stubbins had no staff, no office and no money, but he accepted the commission and signed a contract. Meanwhile, in Boston, his wife Diana (she is British) had engaged a small office and lined up the draughtsmen. In three days everything was under way, and, by working round the clock, the job was finished on time.

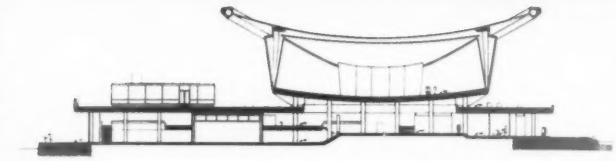
In 1951-52 Stubbins got his first two schools, his practice began to grow, and in 1952 he resigned from the University to devote all his time to it. In his office now are five associates and twelve assistants; the total staff is twenty-six. He considers the much-bandied-about theories of 'organic' and 'standardised' architecture to be largely a matter of words. 'The greatest proponent of so-called organic architecture, Frank Lloyd Wright, has not, in my opinion, built a truly organic structure, only symbols for one. Standardised architecture may be reflected in the work of Mies, but, as a term, it suggests emptiness and sterility.'

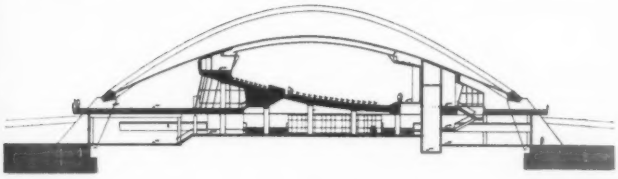
Many architects' obsession today for 'structural ingenuities' is not, he thinks, exactly healthy, but there have been similar diseases before from which we have recovered, and if it were not for architectural publications there would be less desire on the part of designers always to come up with a scoop.









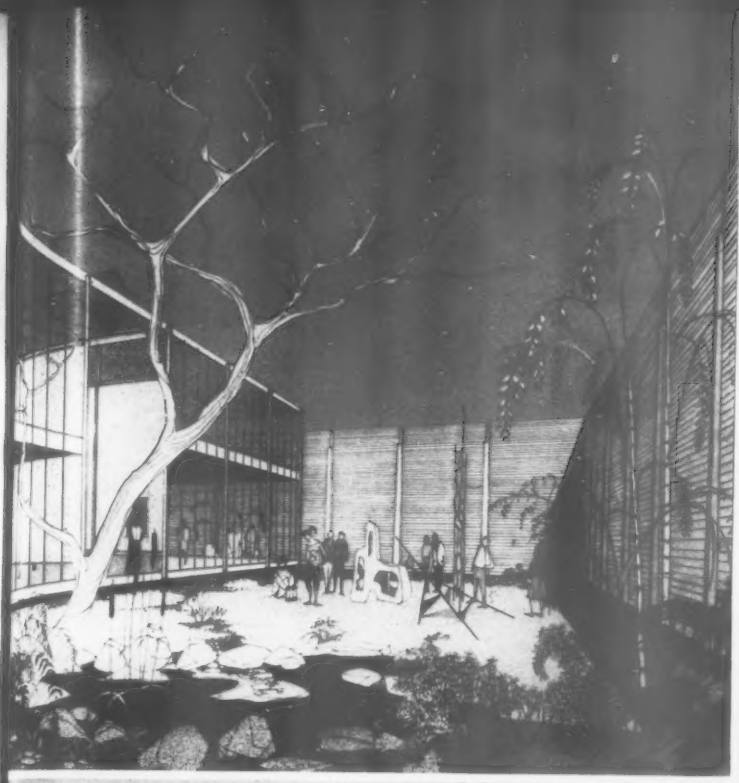


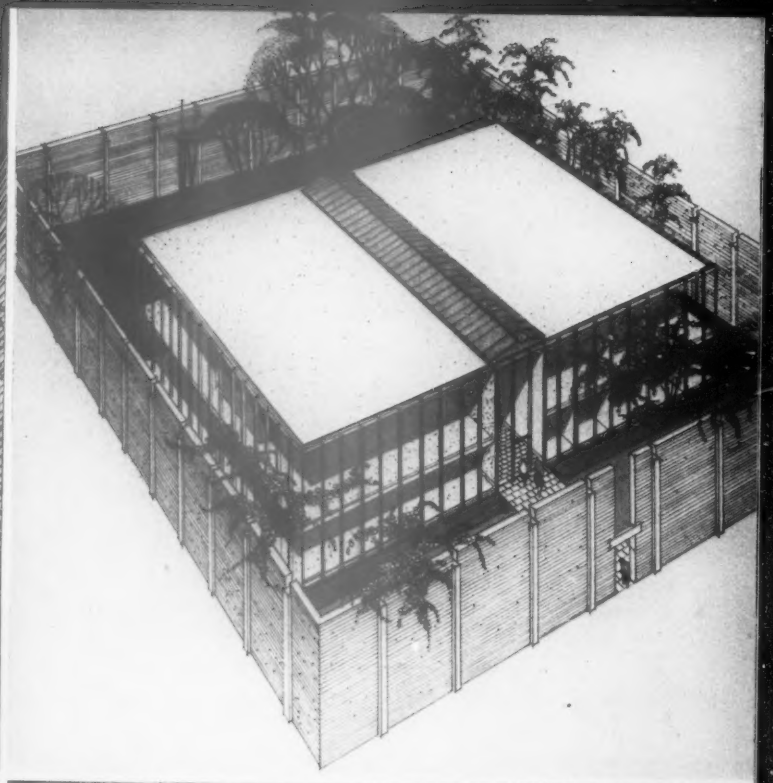
Stubbins (cont.) *Left top, model of the 32-storey office block, part of an urban redevelopment scheme for the Back Bay area of Boston, Mass.; the curtain wall has aluminium frames and alternate panels of glass and stiffened aluminium panels. Left, a 75-unit building of luxury apartments overlooking the riverside in Boston; the frame is of concrete with brick infilling. Top, model of the International Congress Building in the Tiergarten, Berlin, which will be completed for the 1957 Berlin Exhibition. Above, two sections through the Berlin Congress Building.*

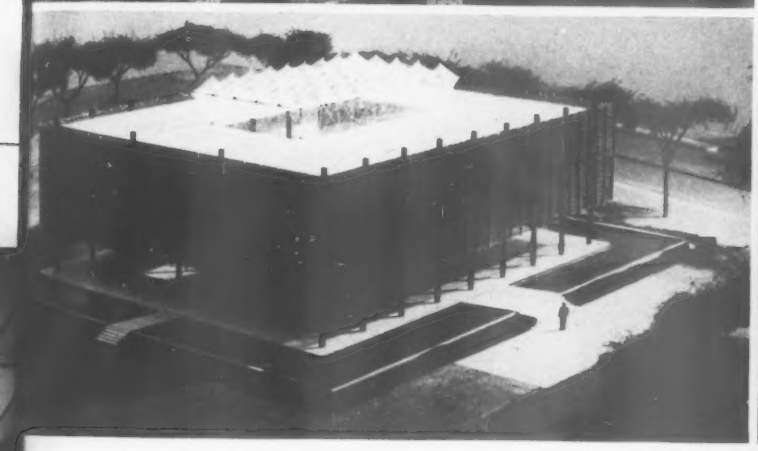
Minoru Yamasaki (Yama to his friends) was born at Seattle in 1912, and spent his childhood there. An uncle who was an architect influenced him to take architecture as a career; he studied at the University of Washington, where the imagination and skill of Lionel Pries inspired all the students, and it is to him, Yamasaki believes, more than to any other person, that he owed his first understanding of how exciting architecture could be. In 1933, during the last year in college, he took a summer trip to Japan, but he considers the visit was wasted architecturally owing to his own immaturity.

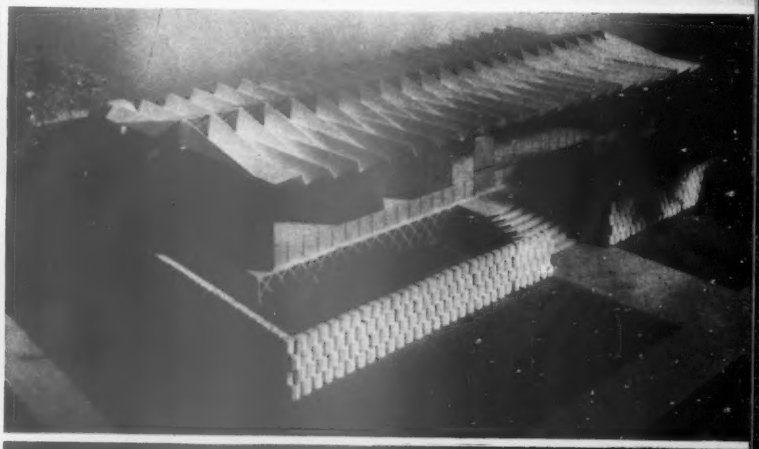
He became a Bachelor of Architecture in 1934; but, owing to the depression, he left for New York, where he wrapped and unwrapped dishes for over a year in an importing firm. His first architectural job was with Githens and Keally—library specialists—where he tried to design for a year before deciding that it was as well to know about construction first. And so, partly deliberately and partly because of the continuing depression, he did working drawings for Shreve, Lamb and Harmon (the Empire State Building architects). The atmosphere there was businesslike and often grim and frightening. Overnight the office would grow to one hundred and fifty men and then week by week they would drop out as a job progressed. Next, a year with Harrison, Foulihou and Abramovitz and a year with Raymond Loewy Associates before moving to Detroit as Chief Designer for Smith, Hinchman and Grylls.

Yamasaki's first independent commission was the remodelling of a brownstone house in New York, done at week-ends and in the evenings. He had little idea of how much such a job would cost and so set a fixed fee based on what the owner wanted to spend—it turned out that he was prepared to spend five times as much—and did, but it was good experience. After leaving Smith, Hinchman and Grylls in 1949 a few houses came along and then two of his former associates from that firm asked him to join them in a partnership on a large public housing project in St. Louis, Missouri, which one of them had obtained as a friend of the mayor. They started in St. Louis with a job worth $7,500,000, and no funds. Nevertheless, some months later they had offices both in St. Louis and Detroit, and for six years the partners commuted back and forth between the two. Now Yamasaki has reduced it to a single base opera-

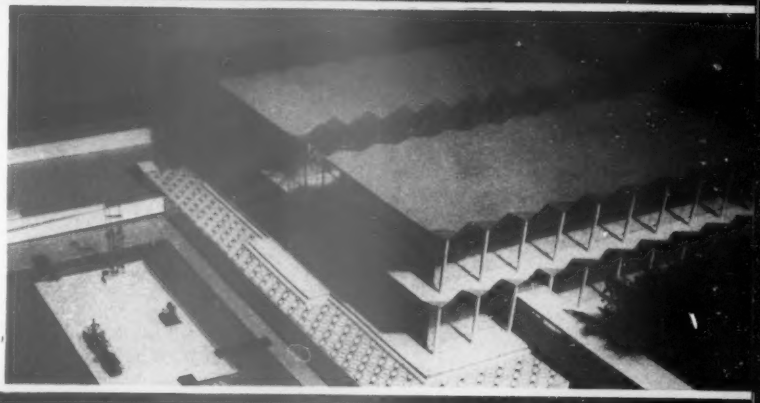








Yamasaki (cont.) *Top left, the sculpture court at the back of the proposed Society of Arts and Crafts building, Detroit, Michigan; top right, bird's eye view of the building which will be all of glass and set behind high walls. Above, proposed office building at Detroit, for the Reynolds Metal Company, the aluminium-screened building will be raised on a platform, surrounded by water and will have a great glass lantern surmounting an internal courtyard. Above right, proposed building for the American Concrete Institute at Detroit; the roof is of shell concrete with a glass lantern along the ridge. Right, the McGregor memorial building at Wayne University, Detroit, now under construction. This view shows one of the sculpture platforms built out on a small lake; ceilings are triangular box beams of concrete, and are supported on marble-clad light steel columns; there are pierced metal sun-breakers running along the upper part of the glass walls; a two-storey-high central gallery is lit by a skylight. Facing page and below, St. Louis Airport; three pairs of intersecting barrel vaults of shell concrete, each 32 ft. high by 120 ft. across, span the great concourse.*

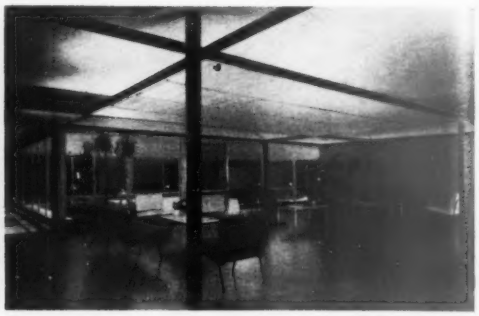


tions—Detroit—and one partner, Joseph W. Leinweber.

Yamasaki most admires Mies among architects because of his 'great and unswerving dedication toward the discovery and understanding of an architecture compatible with technology. . . . Though many of us go off on tangents and aim for a richness that Mies would frown on, I and many others I know base our designs on a fundamental respect for technology which we learned in the teachings of Mies.'

He believes that stylistic differences by regions in the United States are due to romantic notions of a vernacular which are not truly in accord with the building situation as it is. For instance, Harvard and MIT students practise in New York, Texas, California and Michigan; standard and special parts of buildings are transported from all parts of the country to all others. It is unlikely, therefore, that there is much future for regionalism.

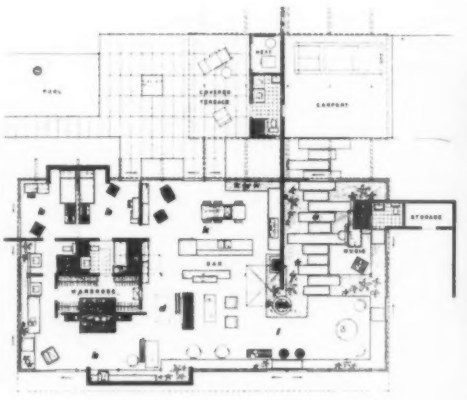
Yamasaki (cont.) *Below, Adams Junior High School, Wayne, Michigan; left, exterior view from the playground, right, lounge area and internal courtyard.*



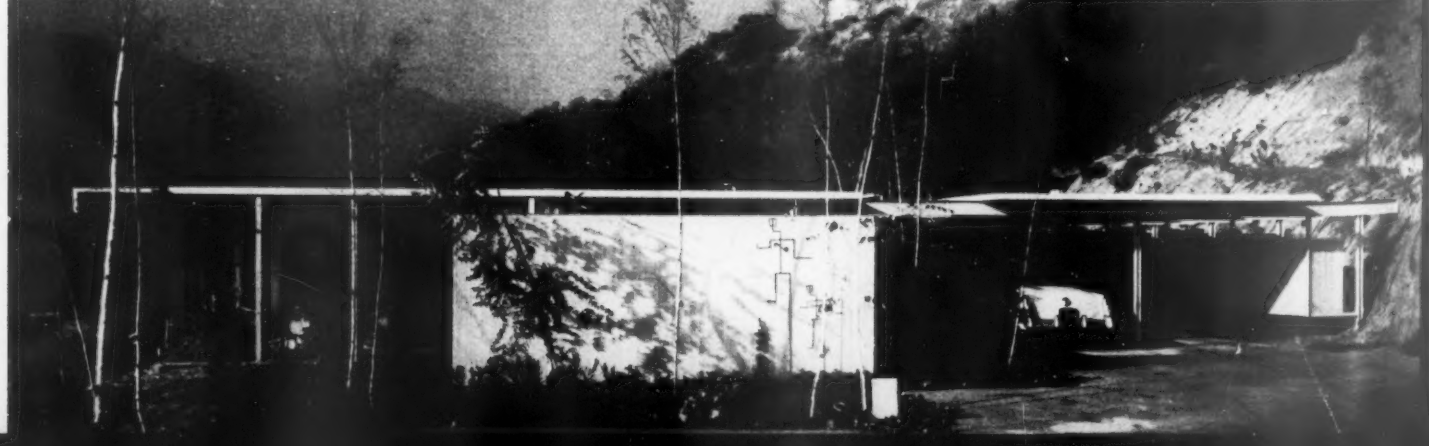
44

Los Angeles, California

A. Quincy Jones, born in Kansas City, Missouri, in 1913, spent his childhood in Southern California. He graduated in architecture from the University of Washington, and although he did several jobs on his own before going into the navy in world war II, his own office only really started in November, 1945. Jones was returned to inactive duty on November 2nd of that year at 10 a.m. At 11 a.m. he called on a fellow architect who had offered him a job to say that he planned to open his own office. He was warned that he would need $2,500 capital. At 1 p.m. he opened office in one of two houses he owned; at 1.30 a Mr. Manoil called and left a $750 retaining fee for a house in Malibu, California. At 2.30 an architect called with an urgent request for two water colour sketches to be done within forty-eight hours and paid $500 apiece for them. At approximately 5 p.m. a Mr. Carter of Glendale paid a retaining fee of $500 for a new house. Before two days were past Jones had just under $3,000 capital, three jobs and no assistants. The partnership of A. Quincy Jones and



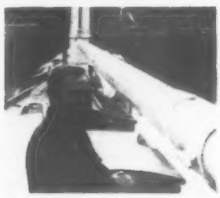
Right top, the Arcadia Metal Products factory; looking through the president's office and the vice-president's office beyond it into the garden. The sliding panel between the two offices is of steel sections, double glazed, with plastic-impregnated paper between the two panes. Centre, living area of Quincy Jones' own house at Brentwood, Los Angeles. Construction is exposed steel frame, painted red indoors, with metal roof decking also exposed. Below, entrance elevation of the Quincy Jones house: the glass walls continue, behind the wooden screen, to the entrance. Plan above.



Left, St. Matthew's Episcopalian church, Pacific Palisades, California. Above, exterior and interior of experimental Eichler Homes X-100, built at San Mateo.

Frederick E. Emmons was formed in 1950, and the present firm tackles a large variety of jobs ranging from $15,000 houses to an $8,000,000 shopping centre. There are three associates and fourteen assistants; the total staff is 20, though close contact is kept up with the various specialists who are called in on a consulting basis. Jones believes that the intimate relationship between architect and client is one of the most rewarding aspects of architecture. But today, if people are to get buildings, particularly houses they can afford, new methods of organisation, construction and marketing must be evolved.

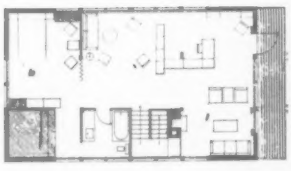
In the residential field, Jones thinks the answer lies in the merchant-built house, with increasing numbers being sold on the market as a retail product. In this, success devolves upon the architect-builder team and the quality of this new kind of client relationship. Merchant-built houses form a large, though not a major part of the work of this firm; the experimental Eichler house (left) is an outcome of architect-builder teamwork.



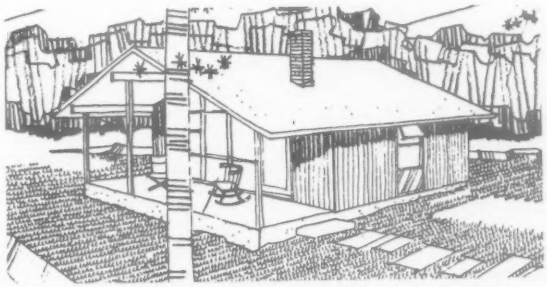
45

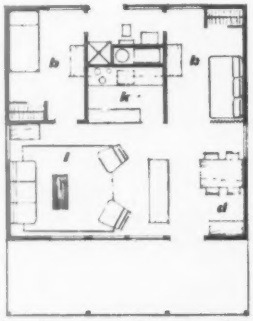
Cambridge, Massachusetts

Carl Koch was born in Milwaukee, and raised in the Chicago suburb of Evanston, and at 45 can claim a unique achievement for an architect—his *Techbuilt* houses are a successful venture into the commercial housing field, which—in the USA as elsewhere—is practically architect-proof. Techbuilt houses, loaded with awards and citations, recommendations and support from organizations as diverse as the AIA and *Parents* magazine, are by no means the whole of his output, but he admits that the Koch office are 'specialists in housing as well'. He trained at Harvard in the confusing period between Beaux-Arts Eclectic and all-out Modern. He feels that his contemporaries at Harvard were 'particularly leaderless or rudderless' and that his own prime orientation came from six months spent in the office of Sven Markelius in Sweden, which left him with an enduring admiration for the Scandinavian approach to life, democracy and architecture—as one might have suspected from the way in which his houses are pitch-roofed without being old-fashioned, modern without being aggressive, charming without being sentimental, saleable without being commercialized. For one who is a successful 'captain of a building team' he shows modesty in supposing that 'few have either the qualifications for captain or those . . . to work as a plain member of the team' and that 'most of us hide our inability to cope with this opportunity behind a supercilious disdain for the necessary attributes'—neither statement, obviously, being true of the president of Techbuilt, even if he does look forward to an 'inactive status' in its administration.



Above, the pre-fabricated 'Techbuilt' house, in one of its six variants; it uses stressed-skin plywood panels. Builders obtain plans and information on a royalty basis. Plans, above left; the house is a rectangle with two storeys under one gabled roof; the ground floor is dropped 3 ft. 6 in. to take full advantage of foundation walls, and the roof pitch is revealed inside to provide extra sense of space in the upper storey.





The 'Techbuilt' prefabricated Vacation Cottage. The buyer, following a complete erection manual which 'Techbuilt' supplies, excavates his lot, pours the concrete foundations and piers himself, and, having given three weeks' previous notice, receives the whole cottage shell in one load and erects it, if he so chooses, with the help of two skilled carpenters.

Left to right, Sarah Harkness, Jean Fletcher, Robert McMillan, Norman Fletcher, Walter Gropius, John Harkness, Benjamin Thompson, Louis McMillen.

average age **44**
Cambridge Massachusetts

TAC, The Architects' Collaborative, is one of the pioneers of group practice, and here one of the partners, Sarah Harkness, contributes an account of the working of the group and its approach to the problems of collective design.

'After ten years The Architects' Collaborative is intact, with the original partners. It was started immediately after World War II, the outcome of several coincidences amongst people who were not even all acquainted with one another, but who had each had a dream in mind of a group practice. Gropius had long before made his experiment in the Bauhaus, where both instructors and students worked collaboratively. Collaborative problems were initiated in the Harvard School of Design under his guidance, and have become a regular part of the curriculum. The Yale members of TAC—Norman Fletcher, Robert McMillan, Louis McMillen and Benjamin Thompson—had talked among themselves about setting up a group practice when they finished school. There was always an idea of making an experiment in living. This later developed into building the communities of Six Moon Hill and Five Fields.

'When the war ended everyone was free at approximately the same time. Gropius asked John Harkness (who incidentally is the only original partner of TAC who was ever a student of Gropius*) to assist him in teaching the Master's class at the Harvard School of Design. It happened that we received a letter from Norman and Jean Fletcher the same day on the subject of how to set up a practice. Putting two and two together we discussed the matter with Gropius, and it was decided within two days to set up a collaborative office in Cambridge. An added push to the establishment of the office was given when the Smith College Dormitories Competition was judged. The Fletchers and Ben Thompson, working in Michigan and Washington, DC, won first place, and John Harkness and I, then in Milton, Mass., came in second. The prize money made the first office funds.

'The first year consisted of very few jobs, but a great deal of discussion. The system of job captains and office meetings was set up. There is a meeting every Thursday noon to discuss either design or business. Meetings are called in between times whenever a subject needs special attention. Every job has to go through a meeting before the design is frozen. The job captain, together with those who have been assisting him, brings drawings, models and pertinent facts and figures to the conference room. A really "hot" design meeting often produces the best architecture. In the end, the changes are those of the job captain himself, because he has the final authority.

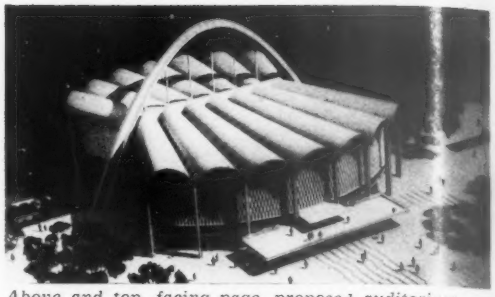
'Architects who practice alone have doubts sometimes about a collaborative office, fearing that if they were part of such a group they would lose their individuality. In a collaborative office, however, something is added, rather than subtracted. Creative talents are stimulated by an active environment. Another question that comes up: is it easier or harder to take a risk in a large partnership? I suppose the answer to that depends in good part on the nature of the partners. However, most risks involve backing. Without the resources of a group most risks could not be taken at all. Although collective thinking sometimes puts on the brakes, or adds safety measures, TAC has gone out on a limb on projects that would have been inconceivable for any member alone at this stage of his career.

'So much for "how" TAC works; the most interesting question is "why" it works. Is it, in reality, "Gropius's Architects' Collaborative"? No one is more annoyed by this misconception than Gropius himself. The idea of a Master surrounded by his disciples is absolutely contrary to Gropius's own precepts. Is it then a remarkable coincidence of personalities that happen to click? Actually, the personalities could not be more different. It is such a "bunch of individualists" that one might wonder how they ever happened to come together. They even have different ways of working and different ways of running a job. To some, a pencil is their sword—if they lost their hold on it they would lose control of the design. Others feel that they can guide the design by remote control. I do not think that the success of a collaborative office is dependent on a remarkable combination of particular people. It is a practical system—on the way to becoming more usual.

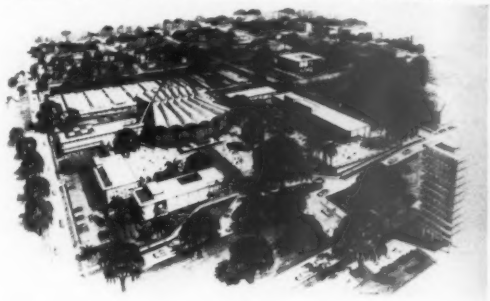
'If there is anything magic in the whole set-up, I believe a good deal of it may simply be a matter of numbers. The partnership (all of the partners having been trained as architects) is large enough so that it would be almost impossible for one person to dominate it. It is also large enough so that whatever idea one member may have, he will always find a willing ear to listen. If it is a constructive idea, he can always find someone to try it out on; if it is merely a "gripe," he will probably talk himself out. However, the group is small enough so that the partnership can meet round the conference table for informal discussion; small enough so that decisions do not have to be made by vote, but only by the "sense of the meeting." Our meetings have been likened to Quaker meetings in this respect.

'Just as it would be impossible to say exactly why a marriage is successful, one can only make a guess as to why an organization works. Along with diversity there must at the same time be a mutual understanding of starting points and directions. In regard to TAC, a few common denominators come to mind: first is the attitude of "live and let live," which could only be held by strong individualists; second is a social conscience—a building is not considered successful unless it answers the requirements of programme and client relations, as well as design—and finally, Gropius's definitions of Total Architecture, the "reunification of art and science," is taken for granted. Owing largely to Gropius's influence over a long period of years, most architects under forty have come out of school equipped, to the best of their ability and understanding, with aesthetic ideals in tune with the world we live in. Various aesthetic expressions have arisen, and will continue to arise. However, there is always a danger that a particular aesthetic expression will cut loose from its origin, at which point it becomes stylistic. There is also the danger that an architect, or an architectural office, that has had some measure of success will become afraid to try anything different. The aim of TAC is to keep a lively approach to every individual design problem, without forgetting the basic precepts of modern architecture that have been so well expressed by Gropius.'

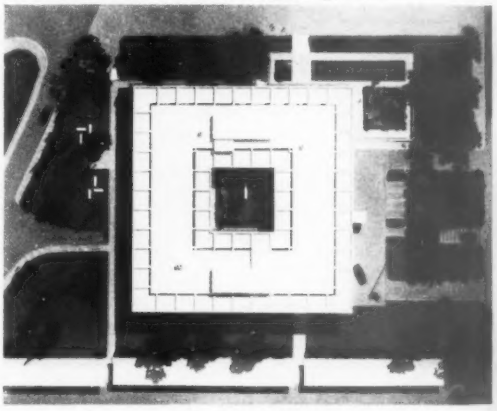
*Chester Nagel, Associate in TAC, is another.

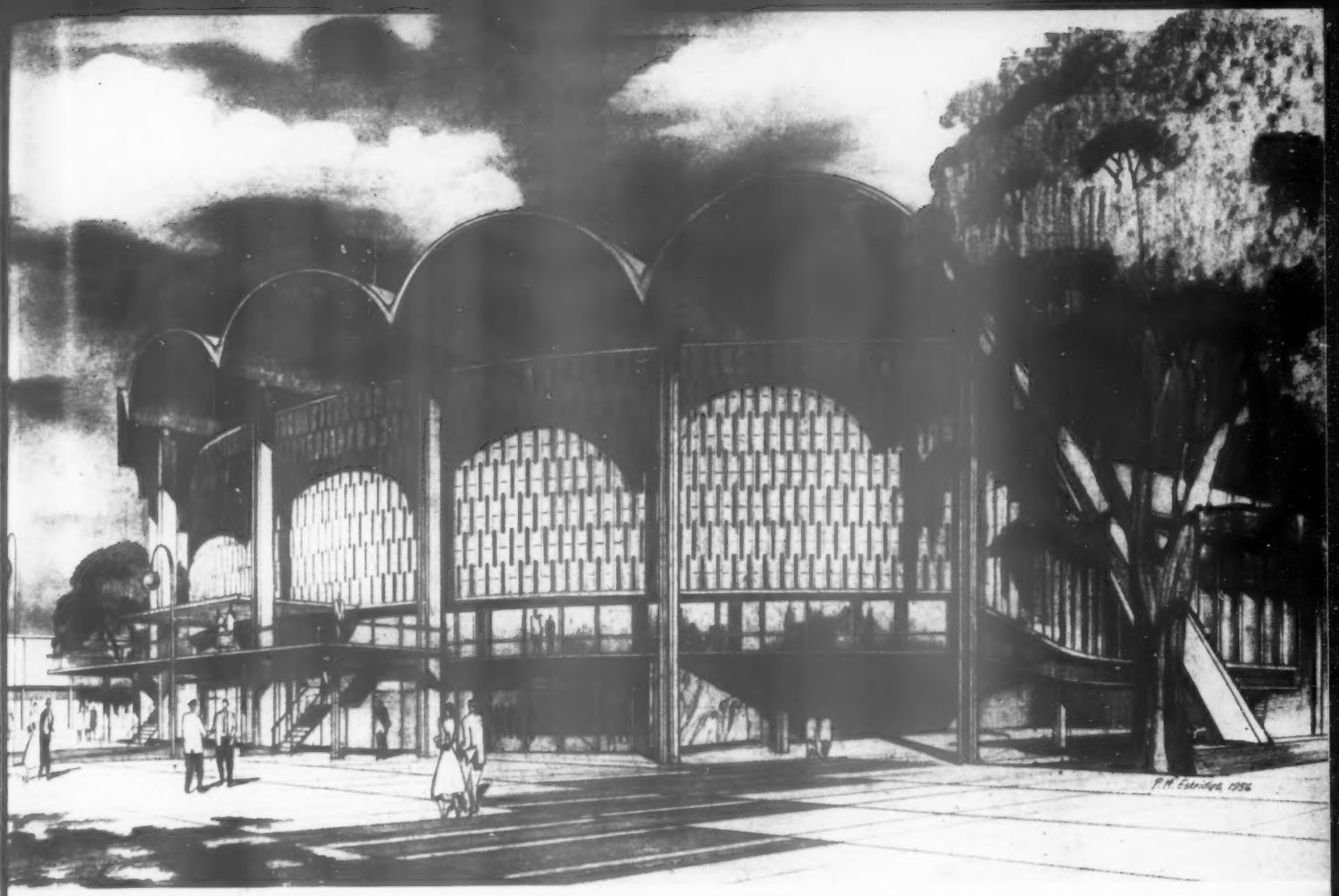


Above and top, facing page, proposed auditorium building for the Tallahassee, Florida, new civic centre. The roof structure, of tapering concrete barrel vaults, is suspended from a parabolic arch. Below, bird's eye view of the civic centre which is a pedestrian precinct. Planning consultants: Reginald Issacs, William Goodman, Hideo Sasaki.



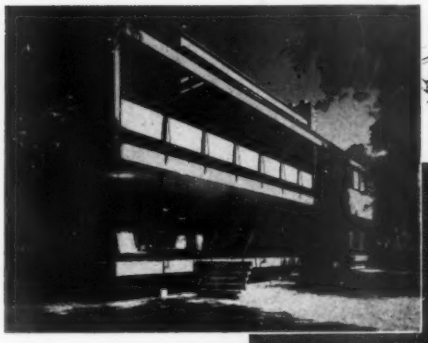
Below, model and right, facing page, perspective of the new US Athens Embassy. The structure is a steel frame, the outer columns uphold canopied eaves, which shade glass curtain walls. The plan centres round a shaded courtyard garden.

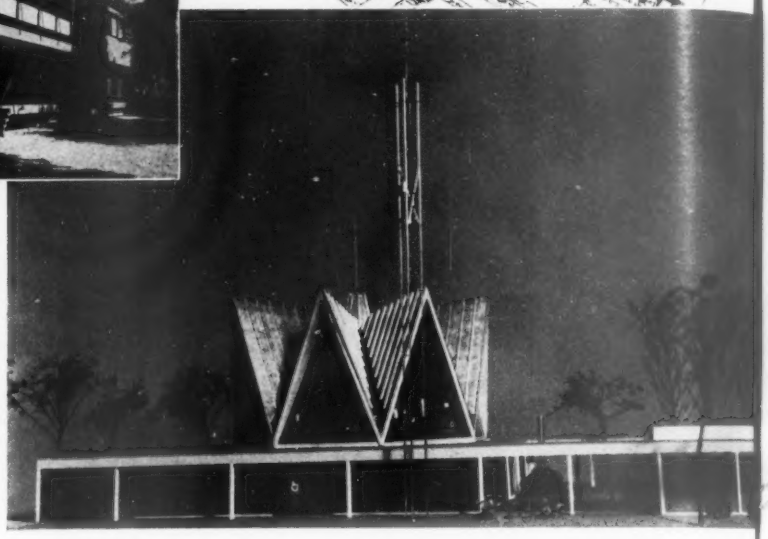



P.M. Estrada 1956

42

Minneapolis
Minnesota





Ralph Rapson's varied architectural career, which includes apartments, schools, embassy buildings (see AR, October, 1955), is represented here by the Gidwitz house, Chicago, Ill., of 1946, above, in collaboration with van der Meulen; the projected civic centre for Fargo, ND (Thorshov, Cerny, Seifert, associates), above right, and St. Peter's Lutheran Church, Edina, Minn., right, now building.

Ralph Rapson was born in Alma, Michigan, in 1914, of a family in which both grandfathers were village blacksmiths. He dreamed of being a painter but decided on architecture when told that 'artists have a most difficu t existence'. He followed up three years studying architecture at the University of Michigan with two years on Regional and Urban planning under Eliel Saarinen at Cranbrook Academy of Art. Frank Lloyd Wright was the strongest influence on his design class, though he was most influenced himself by the writings and work of Le Corbusier. During his two years at Cranbrook he worked closely with the Saarinens, particularly Eero, with whom he later spent two years working round the clock on many buildings and projects.

Next he lived in Chicago and worked with Paul Schweikher, George Fred Keck and Laszlo Moholy Nagy; for four years he was head of the Architecture Department of Moholy's Institute of Design, and considers him one of the truly great teachers of our time.

The first commission was a house for a young teacher and his family, who had bought sixty acres which included a beautiful lake; they had only $3,500 left to spend on the house and the architect's fee; they got a six-room house for this, which Rapson estimates would today cost $35,000.

There are two associates in the office; the number of assistants vary but are usually about five or six; Rapson believes in keeping the office small to maintain quality and control. In addition to his practice he is Professor and Head of the School of Architecture of the University of Minnesota.

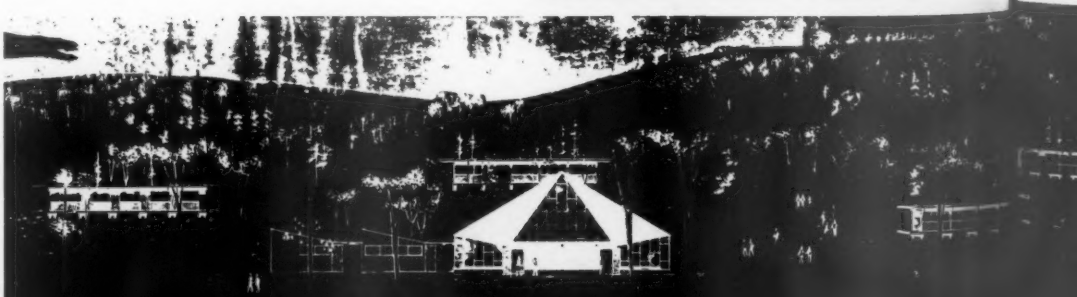
'Economy and technology in the form of improved heating and cooling systems, thermo-sealed heat-resisting glass, modular curtain-wall systems' are all, he considers, 'tending to provide a certain common denominator and common tools to the designer. In many ways I have come to feel,' he says, 'that architecture should embrace anonymity more warmly, that it should provide a quiet, neutral background, in which we—the human beings—provide the colour and animation. There has been far too much of the architect projecting his own "personality" into his buildings.'

'Architecture has become a highly complex art and science in which many specialists must work together.' This will only be successful, Rapson believes, 'if the architect is in complete control.' 'Today,' he thinks, 'they are suffering from an "innovation" complex, a feeling that somehow or other they must come up with something different, something novel, regardless of consequences; they should realise that most people are looking to architects to provide a harmonious total environment rather than a series of isolated and individualistic gems.'

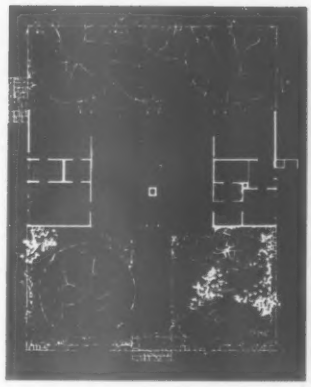
42

New York City

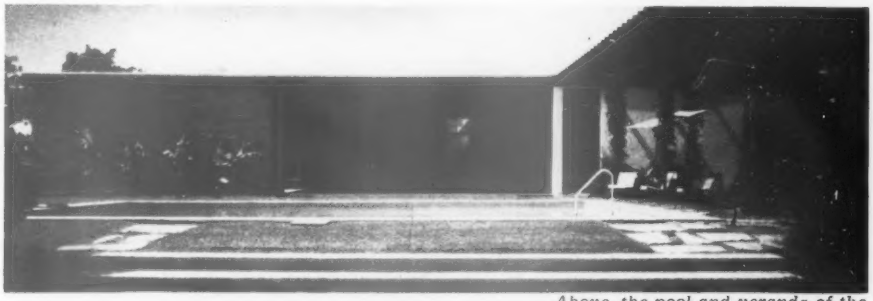
Edward L. Barnes was born in Chicago in 1915 to a father who was a lawyer and philosopher, and a Pulitzer-Prize-winning mother. Architecturally speaking he is a product of the Gropian revolution in US teaching, having studied under Gropius and Breuer at the Harvard Graduate school, and then worked with them on graduation. Nevertheless he counts Le Corbusier's writings as a major influence on his student years, and war-



time experience as a naval architect may also have contributed something to his present manner of designing. Based on a New York office with a staff of twelve, he can claim a varied career in design, covering the *Herald-Tribune* auditorium, aircraft interiors, children's camps, an aluminium pre-fab, and a variety of houses which, at their most characteristically Barnesian, exhibit an unforced formality of plan and elevation which sometimes approaches the Palladian. Not unexpectedly, he is an admirer of Mies, as well as Le Corbusier and Marcel Breuer, also of Klee, Mondriaan, Albers, Giacometti and Calder, was able to use work by the last in a house at Fort Worth, as well as a group by Mary Callery.



Barnes's domestic work is usually characterised by an easy, unemphatic formality; above is the plan and main living area of his own house at Mount Kisco, NY.



Above, the pool and veranda of the Weiner house, Fort Worth, Texas.

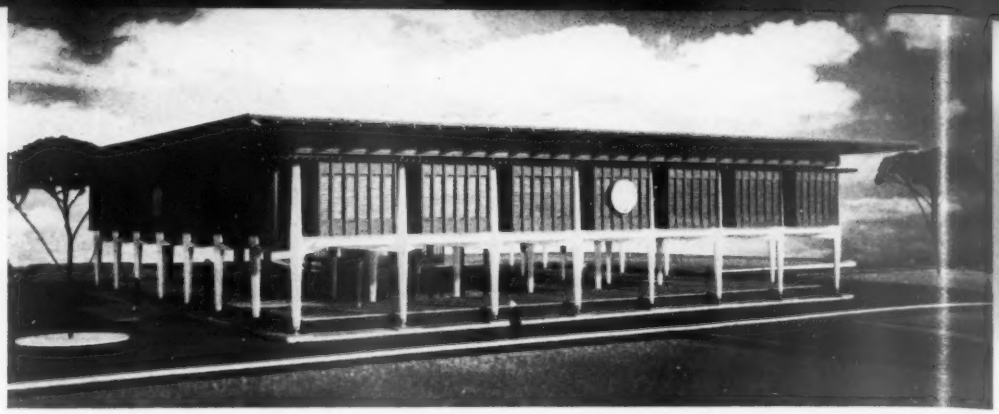
Above, house for the Editor of the New York Herald Tribune, *Whitelaw Reid, at Purchase, NY.*

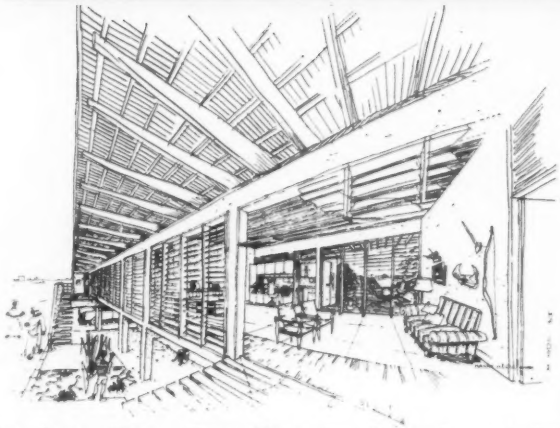
Summer camps are a type of building venture that has exercised the originality of many US architects (notably Wright and Maybeck) and Edward Barnes has designed two. One of these, at Fishkill, NY, is seen panoramically, bottom, with its buildings in small clusters on the wooded site, while individual buildings are seen below; first, interior and exterior of the dining hall, then a 'village hall' play-centre, and one of the semi-permanent tents, far right.

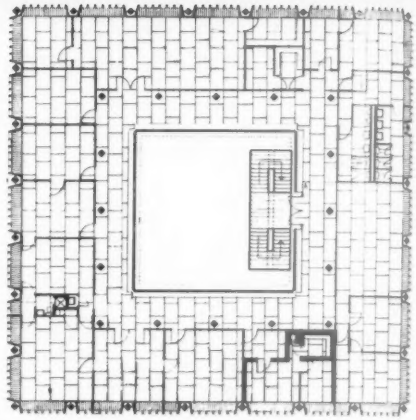
41

Chicago, Illinois

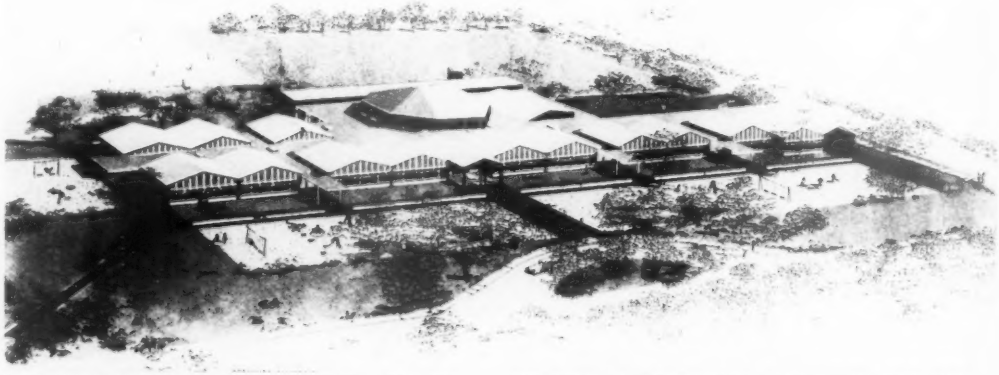
Harry Weese was born in 1915 and is Chicago-suburban by birth and upbringing; he trained at MIT and Harvard in the late 'thirties, and then passed with a fellowship to Cranbrook Art Academy in 1938—an educational tour that brought him into contact with Dean Emerson, L. B. Anderson and the two Saarinens, among his masters, and Bertoia, Baldwin, Rapson and Eames among his contemporaries. With Ben Baldwin he had already a small practice in houses before he joined Gordon Bunshaft in SOM's Chicago office in 1940, an association that he resumed after four years as an engineering officer on a destroyer in the war. About 1940-41, Moholy and Giedion were strong influences and at the same time good friends. His own practice was worked up again from a back room in his wife's Scandinavian import-business in Chicago, and took a turn for the flourishing with a 54-unit housing scheme, which entered the office in the person of the Mayor of the community that commissioned it, the Mayor having come in with a friend who in turn had been referred to Weese by Eero Saarinen and Douglas Haskell of the *Forum*. Most of his work, which currently includes a new consulate building for Ghana, still comes to him by referals from other members of the profession, and Weese's reputation at the moment is somewhat that of an Architect's Architect—not a well-known figure to even the magazine-reading public, but enjoying the wholehearted respect of his fellow practitioners. Like many professionals, he takes an ambivalent love-hate attitude to Frank L'oyd Wright—'I admire him, but feel a lot that is pernicious in the contemporary scene can be laid at his door. . . . Pandora's box emits ranch banks, ranch motels, ranch funeral parlours, ranch office buildings and ranch churches.' It is not surprising, therefore, to find that his current preferences in his own and the other arts incline to the formal and humanist—Corbusier, Breuer, Jacobsen, John Nash; Giacometti, Marini, Bernini; Piero della Francesca, Klee, Miro, Pasmore—and although his style is quite personal to himself, it could be most fairly compared, perhaps, to that of Breuer. His two younger brothers are also architects, one with SOM, the other finishing at Harvard to join what will become the family business, along with Weese himself and his present collaborators, Bruce Adams and John van der Meulen.







For Accra, Ghana, Harry Weese has designed an Embassy standing one storey off the ground on tapered concrete legs, and extensively sun-shaded by a parasol roof that overhangs ten feet. A similar approach is employed in housing designed by him for consular staff at Accra, left, but the Embassy has the accommodation arranged round an inner court, right.



Northside Elementary School, Columbus, Ind., due for completion this year, has an almost traditional structure of load-bearing brick walls and tied wooden arch-trusses for the roofs.

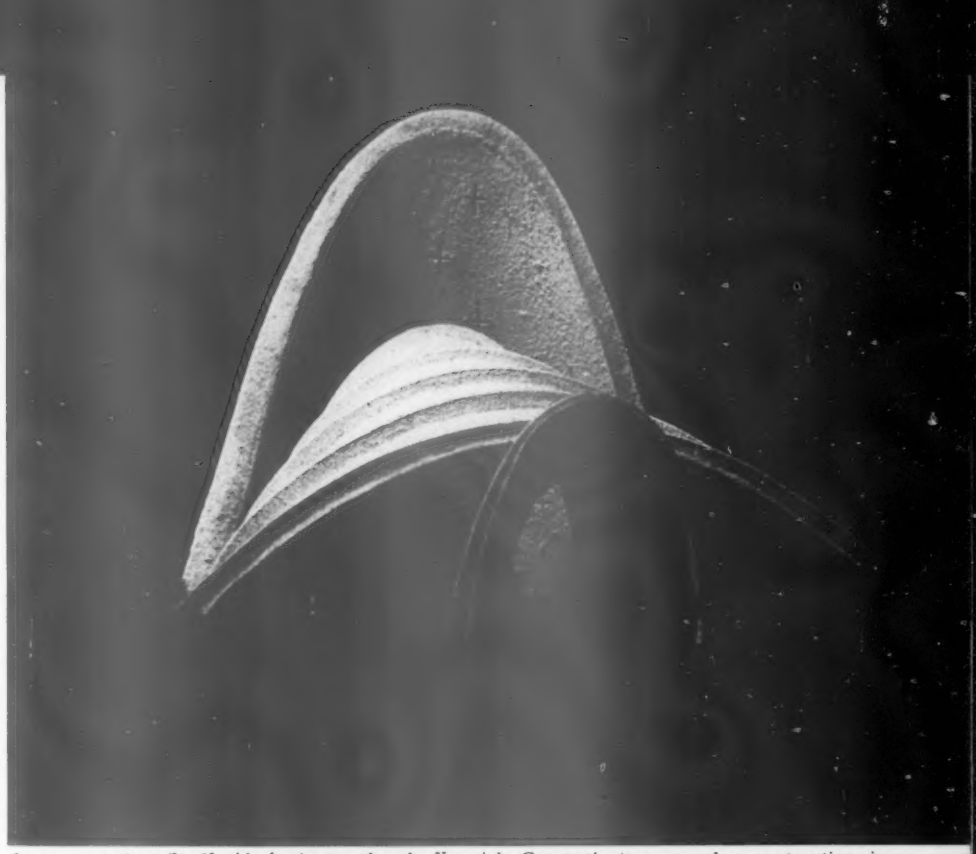
Also at Columbus, the housing scheme, above, is a rare American experiment with row-house development, whose tidy appearance is largely due to the use of mechanical aids (garbage grinders, washer-dryers) to eliminate the need for service access. Another approach to grouped housing is seen at right, the Walton Apartments, designed by Weese in 1955-6, in Chicago, Ill., a co-operative block of 24 five-room flats.

41

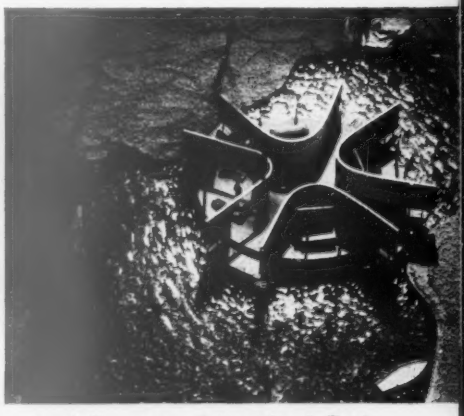
New Canaan, Connecticut

John MacL. Johansen was born in New York in 1916; both his mother and his father were portrait painters. He studied at Harvard under Gropius and Breuer, who, along with Le Corbusier, were his main influences at that time. Later he worked in Breuer's office and at Skidmore, Owings and Merrill. Now he teaches at Yale and has an office with a staff of five at New Canaan, Connecticut, working mostly on houses, churches and experimental structures. Current admirations are Le Corbusier, Nervi and Palladio. He lists influences on American architecture now as: Mies' rationalism in the use of the steel frame; Corbusier's plasticity with concrete; Wright's way with houses; the engineering ideas of Nervi and Candela; the strut construction of Buckminster Fuller, and two other outside influences deriving in the first place from a study of the relevance of the work of past masters to contemporary problems of design and in the second from the impact of other continents on American architects who have received State Department and other overseas commissions (he has himself been appointed architect for the new American Embassy building in Dublin).

Johansen sees a division between the design approaches involved in structural methods employing custom formwork or spray techniques and those employing rolled, extruded or pre-cast parts. The only exception is the three-dimensional space-frame which, though made up of prefabricated parts, can be irregular in volume, outer form and, even, discontinuous. He considers that structural invention is developing faster than most architects can digest it, and though the race between architects to be the first to use a new form has its unfortunate aspects, it is the result of a natural excitement and pride in innovation. Rapid communications and the hope for immediate recognition are partly to blame where architects have employed the new engineering ideas inappropriately; but there is also a failure on the part of the critics properly to evaluate the end result. The passing of time will no doubt see a number of currently acclaimed American buildings finding their rightful, and rather lower, place in the scheme of things.

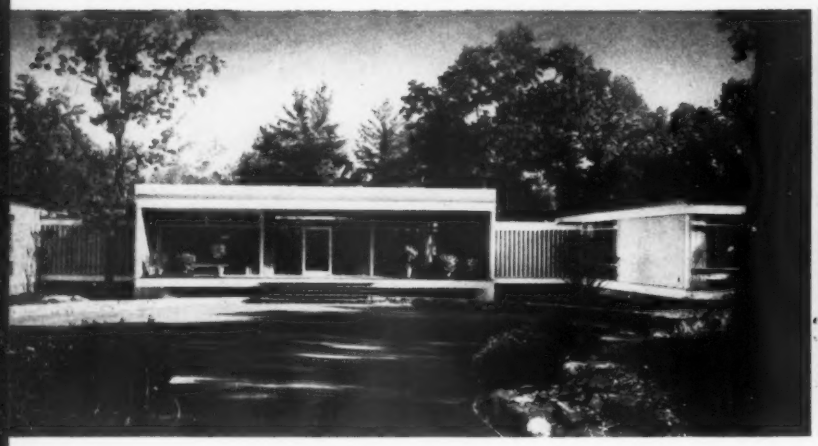


Above, model of St. Mark's Lutheran church, Norwich, Connecticut, now under construction, in a combination of cast and sprayed concrete.



Above left, Architecture Pavilion for the US Department of Commerce, International Trade Fair, Zagreb, Yugoslavia, 1956. The experimental construction was cement sprayed on to an armature of steel pipe, rod and expanded metal: the steel was prefabricated in the US. Above right, model for a Lake-dweller's house with roof removed; it was inspired by the Philosophers' Pavilion at Hadrian's Villa; it would have a concrete saucer floor and saucer dome roof.

Above, Warner house, New Canaan, Connecticut, built over a stream and of 6,000 square feet floor area; structure, concrete and stuccoed concrete block; arched roofs are of wood.

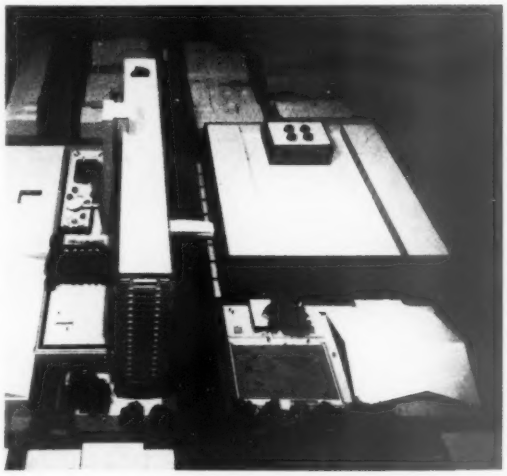


Johansen (cont.)
Extreme left, entrance, and left, garden side of the Goodyear house at Darien, Conn. The 7 000 sq. ft. are disposed on one floor in a central block and flanking pavilions ; an arrangement that Johansen acknowledges to Palladio. The structure is wood framed and stucco on a stone base, with laminated wood beams spanning 48 ft. clear in the centre block.

40
New York City

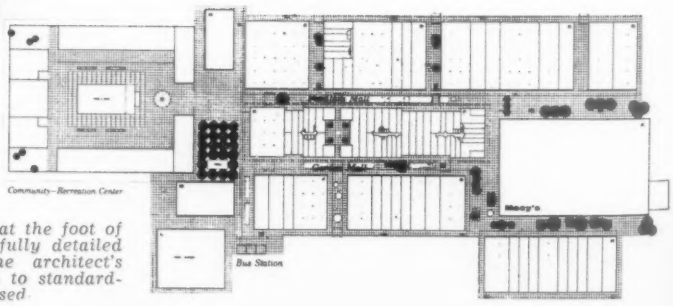
I M Pei, from Canton, China, decided to become an architect in 1933, at the age of 16, on seeing his first skyscraper under construction—the Park Hotel, Shanghai. He went to MIT in 1935, and studied architecture there and (in 1942-3) at the Harvard Graduate School of Design. His great admiration then was Le Corbusier, is now Picasso. His first major independent commission—and first demonstration of businesslike qualities—was the Gulf Oil Building in Atlanta, Georgia, which had to be built within $8 per square foot, air-conditioned, and turned out at seven-fifty. His second commission was for the 'fabulous' offices of the Webb and Knapp organization, illustrated opposite, the first fruit of his working collaboration with William A. Zeckendorf, head of Webb and Knapp and leader of the Enlightened Realtors, for whom he also designed Mile High Centre in Denver, Colorado, and the Roosevelt Field Shopping Centre on Long Island. Pei's office concentrates mostly on commercial buildings and urban redevelopment projects and currently includes four associates and thirty-eight architectural and planning assistants.

A large part of Pei's work is at present concerned with urban redevelopments either on the large scale of town-planning, as in the South West Washington scheme, left, which typifies the formality and local symmetries of his work in this field, or on the small scale of rebuilding city blocks. The classic of the latter type is Mile High Centre, Denver, Colo., which will soon have as a near neighbour the Courthouse Square redevelopment, below and opposite centre, housing a hotel

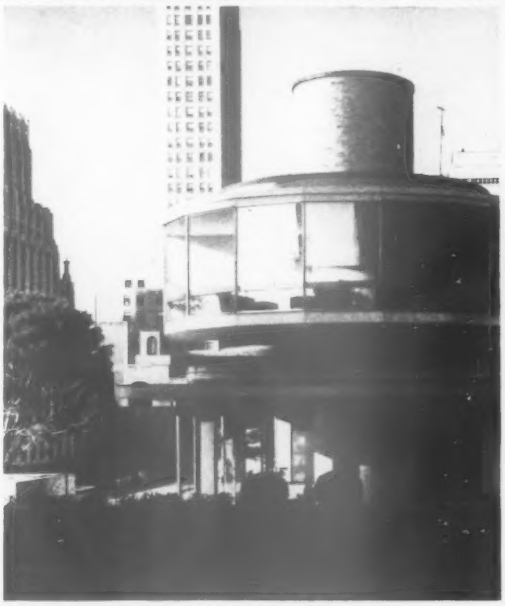


in the tall slab and a department store in the lower block.

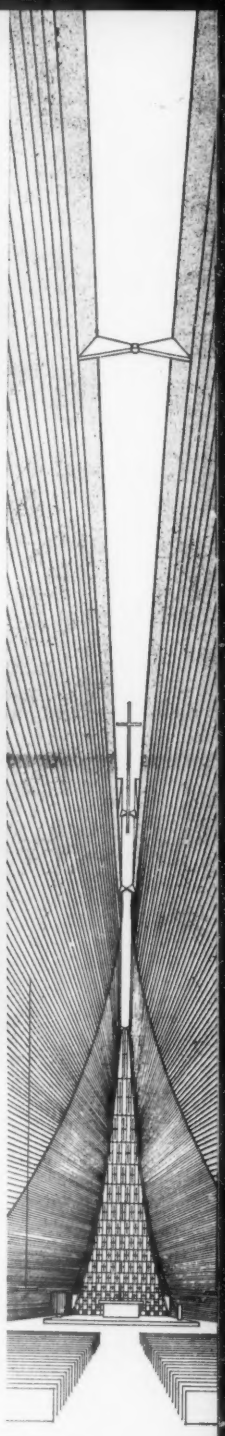
Pei's first important commission was the Gulf Oil offices, Atlanta, Ga., an economical, ingenious and visually straightforward administrative building, above. He has also contributed a distinguished exemplar to the growing body of exurban shopping centres ; at the right is the plan of the Roosevelt Field Shopping centre, Long Island, with views along its malls at the foot of the opposite page, showing a carefully detailed pedestrian street-scape where the architect's responsibility extended down even to standardizing the types of lettering to be used



Pei (cont.) *For Webb and Knapp, financiers of many of the schemes he has designed, Pei created a spectacular office-suite in New York; left is a view down into the presidential office, above right, the roof terrace, right, the semi-circular dining-room with skyline panorama.*



The chapel for Tunghai University on Formosa will be one of Pei's most unusual structural adventures; on plan below, an irregular hexagon, it will be enclosed by two pairs of warped mutually-supporting laminated wooden surfaces, leaving a narrow skylight open along the central ridge, right.

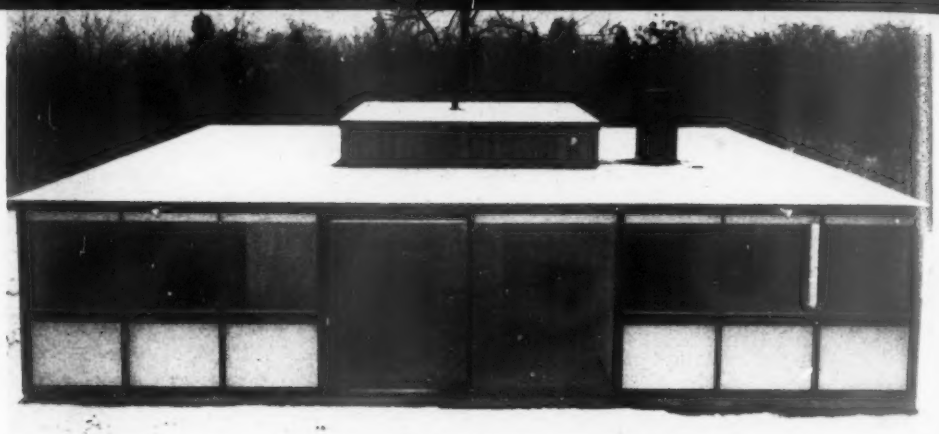


39

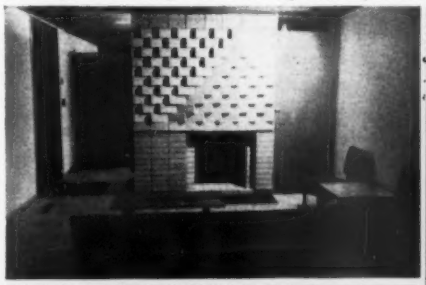
New Haven, Connecticut

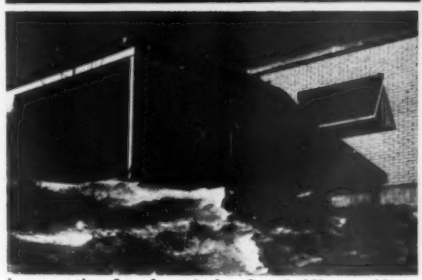
King-Lui Wu was born in Canton, China, in 1918. His father refused to be called a businessman and spent a great deal of his time painting and writing poetry; this home atmosphere and the importance of engineering in China at that time decided him on the career of architecture at the age of sixteen. He entered the University of Michigan in 1937, for a year, and then went to Yale until 1942, when he transferred to Harvard and spent two years with Gropius and one with Martin Wagner (town planning). At that time two books made a strong impression, Whitehead's 'The Aim of Education' on his mind, and the eighteenth century Chinese novel 'The Red Chamber Dream' on his emotions.

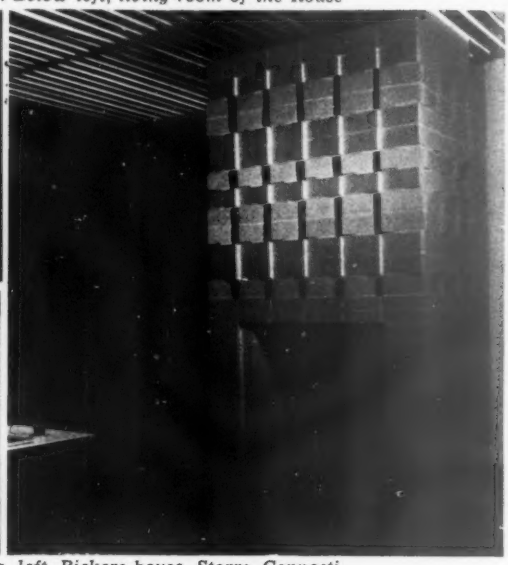
His first commission was a big one—to rebuild Yale-in-China in Changsa. It included a public school, part of a medical centre and a group of faculty houses totalling over a million dollars. He went to China in 1947 and completed the designs there that year, returning to Yale to have them accepted in 1948; the project was a casualty of the revolution. He now has an office in New Haven, Conn., where he is also associate professor of architectural design at Yale.



Above, Rouse house, North Haven, Connecticut, 1955. Construction is post and beam with cypress siding and building board panels. Below left, living-room of the Rouse







house; the fireplace is by Josef Albers. Above, left, Rickers house, Storrs, Connecticut, 1956. Above right, fireplace in the du Pont house, Woodbridge, Connecticut, 1957.

38

Cambridge, Massachusetts

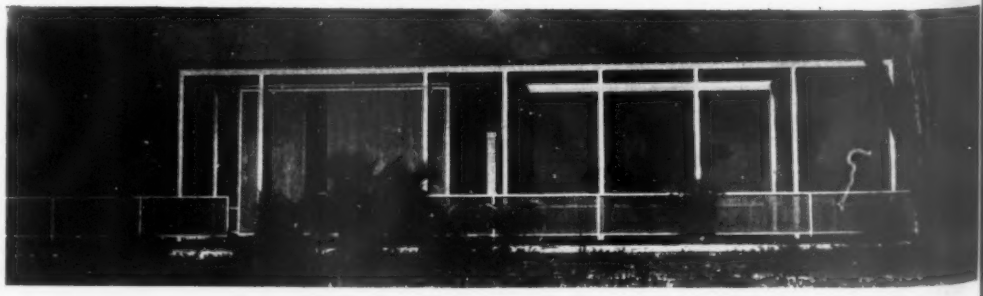
Paul Rudolph was born at Elkton, Kentucky in 1918. His father is a parson; both his mother and his sister are painters. He studied architecture at the Alabama Polytechnic Institute from 1935-40 and then before going to the Harvard Graduate School of Design in 1940 worked in the office of E. B. van Keuren, where he discovered he knew neither how to make working drawings nor how to put materials together; this was such a shock that he literally found it hard to talk for almost a year, but in the ensuing silence he managed to learn a great deal. From 1943-6 he was Officer-in-charge of ship construction in the Brooklyn Navy Yard, and returned to Harvard in 1946 for a final year. The teaching of Walter Gropius and the writings of Sigfried Giedion made the strongest impression at this time. During 1948-49 he travelled in England, France, Italy, Switzerland and Belgium on a Wheelwright Fellowship.

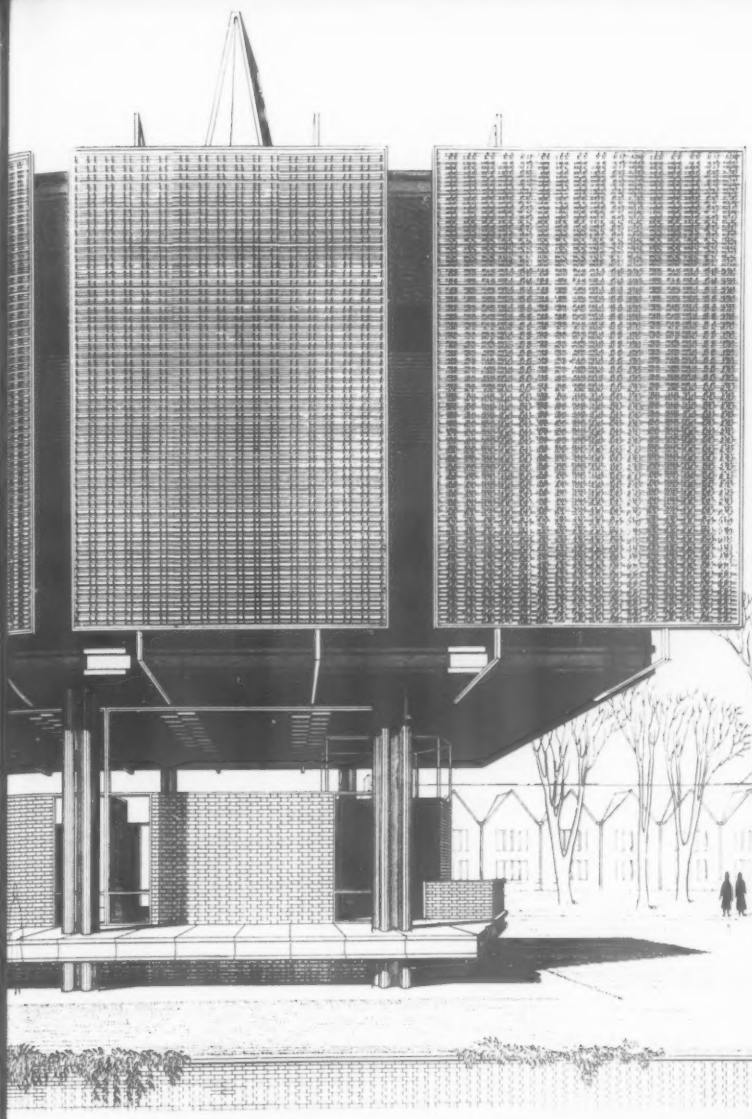
His first commission was a house for a language professor at Alabama Polytechnic Institute at Auburn, Alabama; it was completed in 1940, but Rudolph now considers the conception, right down to the detailing, very naïve indeed. By the time the second commission, a house on the west coast of Florida, completed in 1946, came he had set up in partnership at Sarasota, Florida, with R. S. Twitchell, the partnership terminated in 1952. The total staff is now eight, with offices in Sarasota and Cambridge, Mass. He has been visiting critic at about a dozen schools of architecture in the USA.

Although Rudolph's published thoughts often refer to European buildings and town-planning, they are specifically oriented to American problems—'We tend to build merely diagrams of buildings. The diagram consists of regularly spaced bays, with the long sides filled

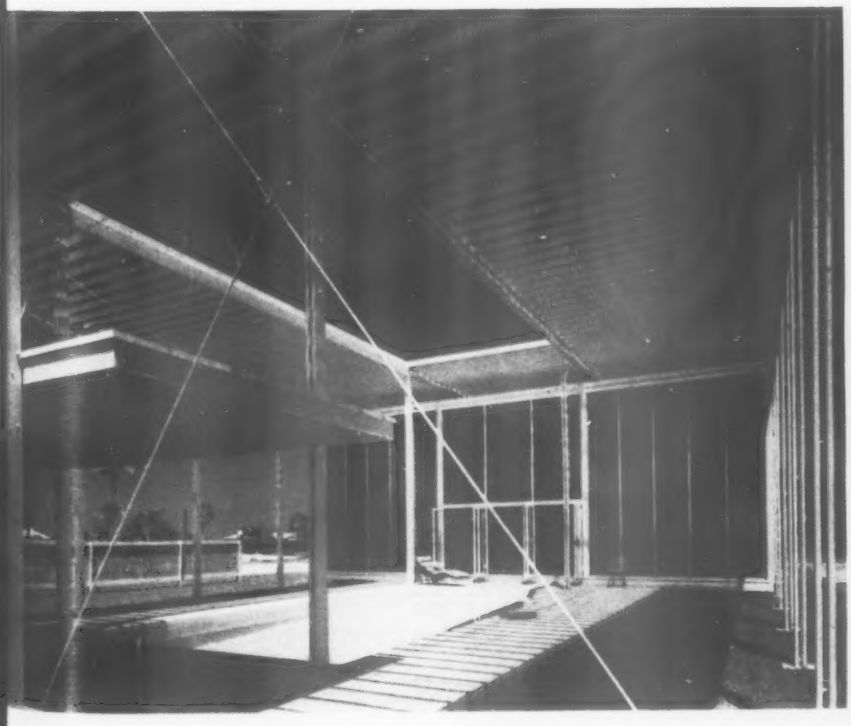
[*continued on page* 380

Typical of Rudolph's light-touch with timber is the 'Umbrella' house below and bottom left, facing page, at Lido Key, Florida. The 3,000 sq. ft. latticework sunshade covers both pool surround and house over which it floats leaving a 2 ft. airspace. The house itself is a two-storey structure 44 ft. by 25 ft. Bottom right, facing page, lookout platform at the Sanderling Beach Club, Florida, another example of gracefully poised, tie-rod-braced timberwork.





Rudolph (cont.) *Above, model of the Mary Cooper Jewett Arts Centre, by Paul Rudolph, for Wellesley College, Massachusetts. In his design Rudolph has aimed to follow the basic traditions of the campus, which are: 1, major buildings sited on hills, leaving the valleys in their natural state, 2, buildings grouped in clusters round courtyards, with the space between clusters unimpeded, 3, elaborate silhouettes, with facing materials of brick and limestone and formal emphasis on the vertical. The square building (to the left in the model) comprises a classroom and auditorium core standing free in a clerestory-lit covered courtyard surrounded on two floors by practice and listening rooms, library and offices. A bridge exhibition gallery leads to the art building (classrooms, library and offices, study rooms and studios, on four floors) the south-east corner of which is shown in the drawing on the left. The projecting grilles are of porcelain-enamelled aluminium, 'a kind of built-in ivy': other ways in which the design carries out the requirements of the third tradition listed above are: 1, a module of 15 ft.; the same as the existing buildings, 2, similarity of heights between old and new blocks and subsidiary elements, 3, the use of red brick and precast concrete with limestone aggregate, 4, silhouette provided by prism-like skylights, 5, intimate scale* *(see also page 390).* *Associated architects: Anderson, Beckwith and Haible; David Johnson, job captain. Landscape architects: Sasaki and Novak. Structural engineers: Goldberg, Le Mesurier. Associates: Electrical and mechanical engineers: Stressenger, Adams, Maguire and Reidy. Acoustical consultants: Bolt, Beranek and Newman.*



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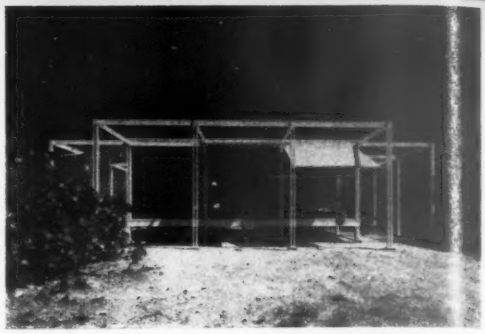
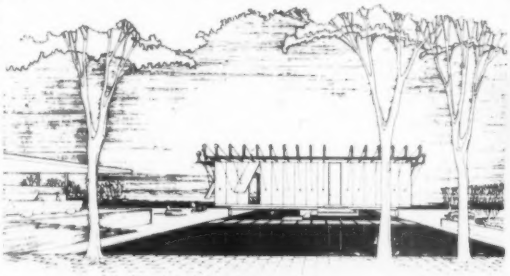
with glass, and the end walls filled with some opaque material. If we raise it on pilotis we might even snare an important prize.'

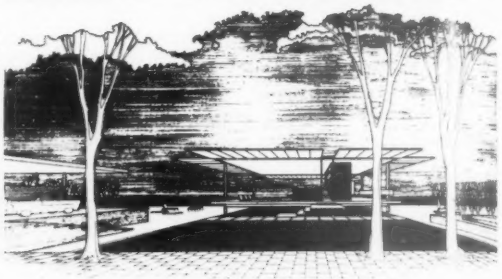
He takes a poor view of the disruptive influence of technical specialists on the architect's unity of conception, and an even poorer one of America's illogical set-back rules and unfocused townscapes. His concern for the relation of one building to another is a subject on which he frequently invokes the Old World to redress the unbalance of the New. Like Mies he has directed attention to the problems of reflectivity in glass façades, and like Mies he has experimented with mode's to investigate visual effects—the relationship of the new campus buildings at Wellesley to the old ones, and to the eye of the visitor approaching by road—about which theory and the drawing-board are silent. (See also page 393.)

'What the architect has to offer in the final analysis,' he believes, 'has not changed through the centuries. Only the means change, not the end.'

Rudolph (cont.) *Right, the Walker guest-house, Sanibel Island, Florida. It was one of a number of houses chosen by* Architectural Record *(February, 1957) as representing 100 years of significant building, and John Knox Shear writes in this connection, 'in a sense it almost sums up the principal characteristics of Paul Rudolph's contribution to date: its fine, spare frame is carefully scaled; the total structure—in plan or profile—presents a simple, retainable image; its voids and solids produce a rich play of light and shadow . . . its moving flaps permit a flexibility in use and in appearance; . . . (it is) an architecture developed out of disciplines and concerns which transcend the local and the immediate.' Below, exhibition house for the Home-style Center, Grand Rapids, Michigan, with wall panels suspended on counterbalanced pulleys.*







37

Berkeley, California

Roger Lee was born in San Francisco in 1920. He studied architecture at the University of California, qualifying in 1941, after which he worked with the US Army Engineers. After the Army he worked for a year in various architectural firms in Los Angeles, and then for two years in San Francisco as an associate to Fred Langhorst. Now he is in private practice across the bay in Berkeley. He has always been interested in good design at a low cost; an early example of this is his own home which he built in 1948, right and below. It combines red-wood beams, planks and posts with corrugated aluminium.

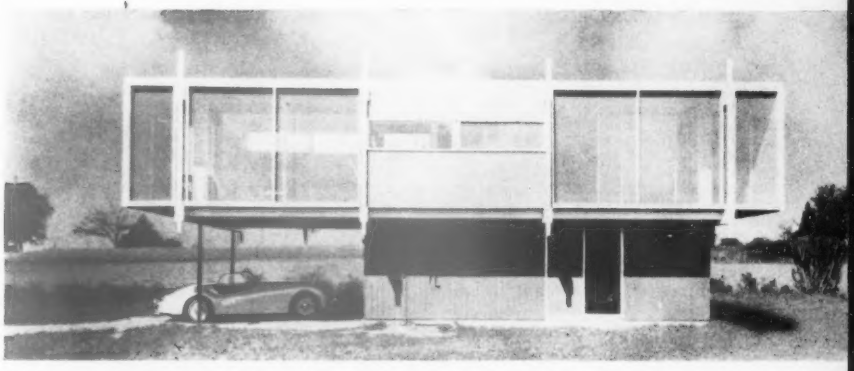
Above, left, the Elizabeth Perry house, Berkeley, California; one-storeyed and on a sloping site. It is timber-framed, and the openwork structure shading the patio, the ceilings and internal walls are redwood, internal screens are plastic. Right, the Channing house, Sausalito, California, which looks west over San Francisco bay, also timber framed, with exposed Douglas fir plank and beam roof.

Roger Lee's own house near San Francisco. The site slopes steeply and the entrance, left, is on the upward side, adjacent to it being a study-office, which can be closed off by a sliding screen of shoji panels. Right, the entrance, showing the brick-paved approach walk and the plastic panels that screen a small patio for the study behind. Below, the garden front, with sliding glass walls.

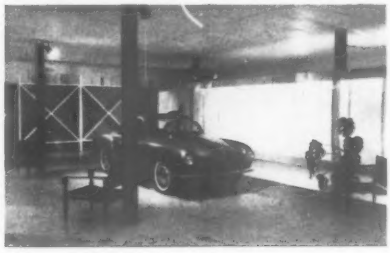
37

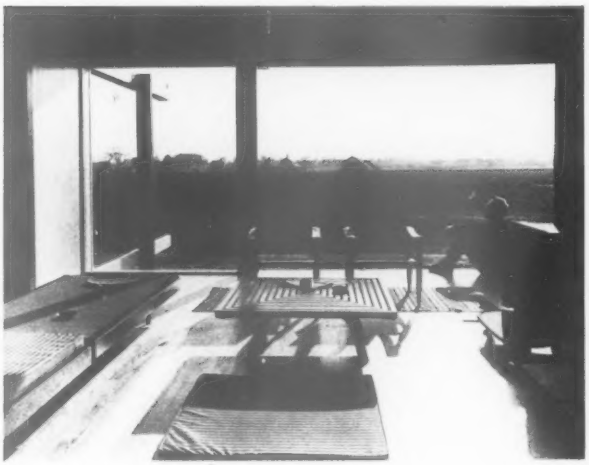
New York City

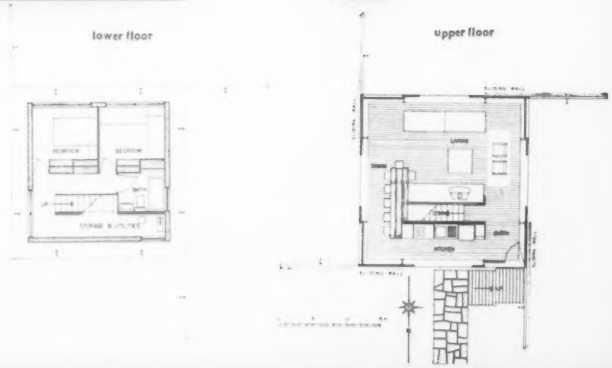
Peter Blake, born in Berlin in 1920, has had a brilliant zig-zag career around the fringes of the US architectural profession. He arrived by way of Serge Chermayeff's office and the Regent Street Polytechnic in London, and later studied at the Pratt Institute, but is still not a paper-qualification architect. On the other hand, he has been curator of architecture and design at the Museum of Modern Art, an associate editor of the *Forum* and is now Architectural Editor of *House and Home*. Making the best of both worlds, he has to his credit as designer or associate designer a number of houses, conversions and additions, including an ingenious open-and-shut house for himself, and a showroom for Volkswagen, while remaining a telling opinion-maker in the tough (but influential) field of merchant-builder housing through the pages of *House and Home*.



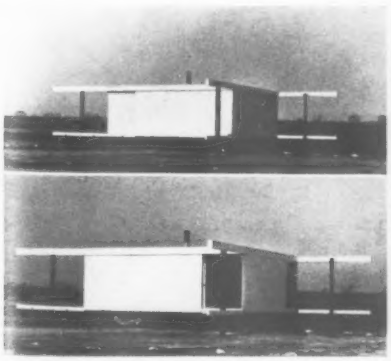
Above, the Russell house, Bridgehampton, Long Island; a timber structure supported on 3½-in lally columns; external wall finishes are horizontal siding for the ground floor and plywood, fibreglass screening and asbestos for the first.

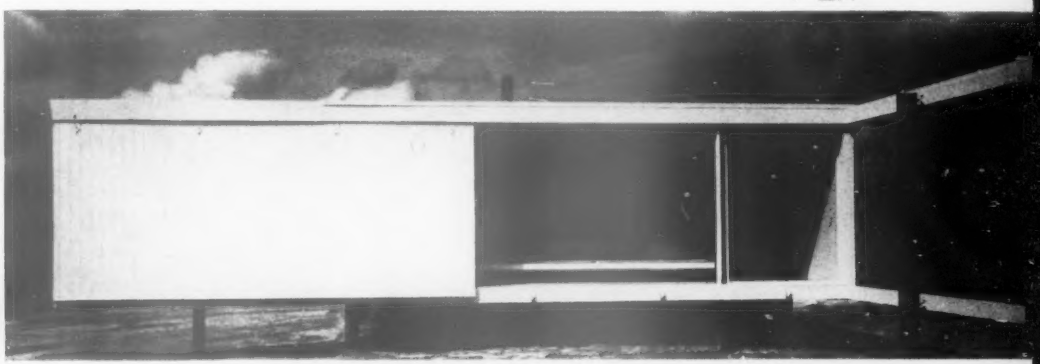






Above, the Volkswagen showroom, Bridgehampton, Long Island, which Blake remodelled in association with Richard Stark. Below and above right, Blake's own pinwheel holiday house on Long Island. The living area on the upper floor is 24 ft. by 24 ft. Each wall of the house consists, reading from left to right from inside, of a 6-ft.-wide fixed glass panel, a 12-ft.-wide opening that can be screened, and a 6-ft.-wide wall panel faced with plywood. The key to the pinwheel system is an 18-ft-long and 8-ft.-high sliding wall, hung from an overhead track, one on each side of the house, which can cover or open the 12-ft. centre openings. Structure is twelve 15-ft. light steel I-beams set into a steel drum filled with concrete, the purpose of using steel being the need for windbracing. The sliding walls, sub-floor and roof-decks are plywood. The house cost $8,300, and took eight weeks to build. Above right, looking out from the living area; below, three views showing the sliding walls in various positions. Paul Weidlinger was the structural engineer.





Ulrich Franzen was born in the Rhineland in 1921; his family (father, writer; mother, psycho-analyst) emigrated to the USA in 1936, where Franzen went to high school and learnt about 'co-education.'* At college (Williams), a small liberal arts institution in Massachusetts, with an excellent fine arts department, he gained insight into and enthusiasm for 'the quattrocento, High Scholasticism, the Renaissance, the Baroque and Wölfflin', all of which, he considers, has become part of his equipment as an architect. Wright's theories of organic architecture made a strong impression during college years and, although he still doesn't understand their meaning, he thinks he's outgrown the damage they did. After military service in 1942-45, architectural training at Harvard, with Gropius and Breuer in the saddle, was a cleansing process and a beginning. A commission followed immediately afterwards; but the small private practice that grew from this was ended by the Korean war and Franzen moved to New York, into the office of I. M. Pei.

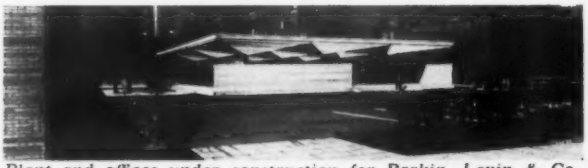
His present office, started in 1955 with an accumulation of residential and commercial commissions, has a staff of five assistants. Franzen's inclination is for quality work with a stress on personal service.

His admirations are Mies, Corbu and Gropius (Breuer was important in the formative years) with esteem for Philip Johnson growing.

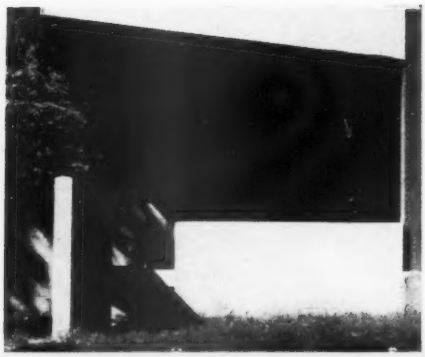
He sees no validity in regional differentiation in American architecture today ('The difference from area to area is only the difference of running the air conditioner three weeks or three months of the year.'). Stylistic cleavages he distinguishes as 'constructionist' and 'mannerist or eclectic', citing Saarinen as an example of the latter predicament, which results, he believes, from missing the 'Bauhaus mill' and the influence of cubism.

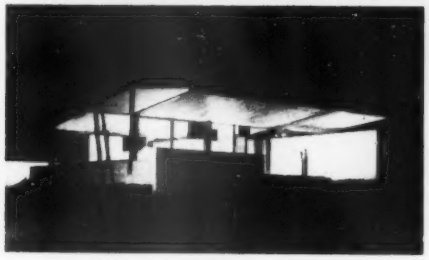
Franzen feels a compulsion to resolve the problem of equilibrium in visually comprehensible terms, and thinks that once an architect has a sixth sense for systems of construction and a grammar of detail to draw on, personal expression can be channelled more productively.

*Franzen thought of becoming a painter but his mother warned him against the Bohemian life and so architecture seemed preferable.



Plant and offices under construction for Barkin, Levin & Co., New York City. The steel umbrella structure on concrete platform is linked to a sealed manufacturing unit on the right.





The Arthur Murray house, 1956, overlooking Long Island Sound, is a pavilion of prefabricated steel umbrellas, joined as three hinged arches. The walls of the living area (below) are fixed glass on the garden side and sliding glass at either end, leading on to the terraces. The bedrooms, top right, have brick walls with continuous glass strips above, butt-jointed at the corners. Top left and above right, one of the terraces. Above left, night view of the house. Facing page, top, general view from the garden; below, the bedroom elevation.

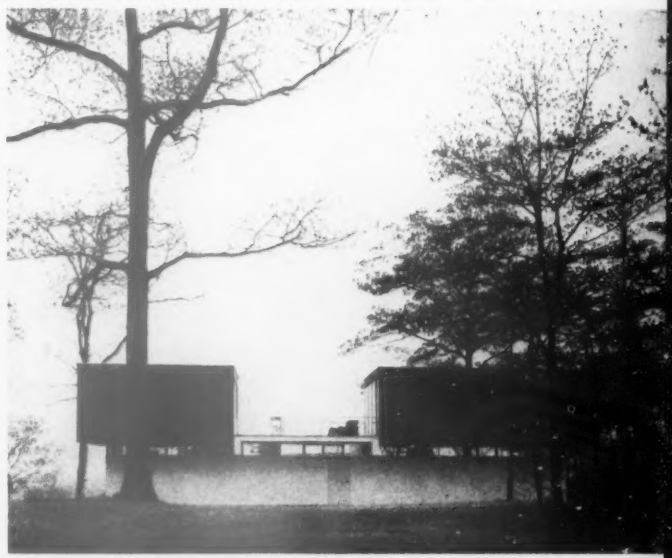
35

Sarasota, Florida

Reginald C. Knight was born in Grandfalls, Newfoundland, in 1921. His father is a craftsman, builder and pianist, who has designed and built churches, public buildings and sailing ships; his mother's family were ships' captains, sea traders and fishermen.

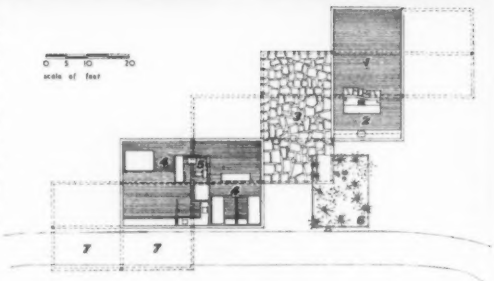
He grew up in East Aurora, New York, a beautiful small town in the western part of the state, now ruined by unplanned development and the cutting down, in 1937, of hundreds of American elms to widen the main street. He has always wanted to be an architect, and

1, entry. 3, study. 5, living-room. 7, bedroom.
2, garage. 4, outdoor terrace. 6, kitchen. 8, bath.



Above, the Swain house, Plainfield, New Jersey, situated on a high cliff, with a view of New York. The house is steel framed, the cladding is mahogany and the terrace is of random slabs of sawn white marble. Upper picture shows a terrace, connected to a higher one, seen in the view above.

Knight (cont.) *Above, the Stahl house, Siesta Key, Sarasota, Florida. The frame is reinforced concrete ; the roofs are laminated wood on an armature of steel pins set in the frame. Flashings are stainless steel, doors aluminium and terraces slate. Plan key : 1, living area ; 2, kitchen ; 3, terrace ; 4, sleeping area ; 5, bath ; 6, plant box ; 7, car port.*



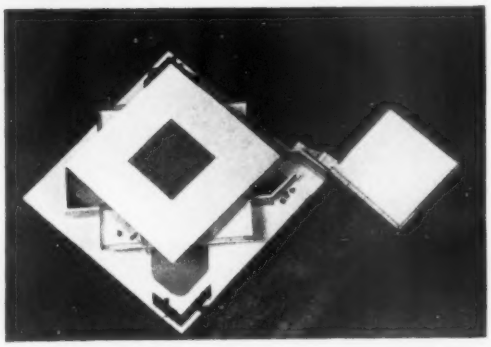
Left, the C. J. Morrison dental clinic and residence, Sarasota, Florida. The plan is three U-shaped white brick walls, two joined together to form a court between the living area and the clinic, the third at the back forming a garage and utility room. At the inner plane of the brick walls is a galvanized wrought iron screen, traversing all the windows and court openings. Roof rests on interior partitions and on 1-in. steel pins set in the outer wall.

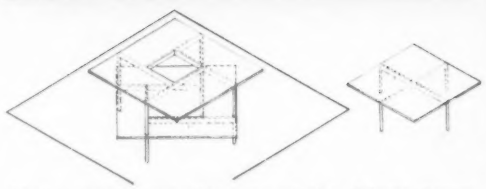
studied at Harvard, Columbia and Syracuse College of Fine Art. Knight is now on the faculty of MIT.

After qualifying he joined Skidmore, Owings and Merrill and worked, among other things, on the designs for Lever House. Since 1949 he has practised on his own in New York City and Florida.

He considers Le Corbusier's Chapel at Ronchamp one of the greatest works of art of our time, and its architect the greatest in the world, whose influence few will escape—perhaps for the next century. Frank Lloyd Wright he also admires and doesn't believe he and Le Corbusier to be as far apart as they are generally believed to be, because both men seem to him to be trying to put the human being at the centre of art. He wishes the public could see the need for collaboration from the start between architect, engineer, painter and sculptor.

In America, he thinks the architects and planners are outranked by the financial and real estate experts. Ideally big jobs should be a matter of teamwork with the architect responsible for the total picture.



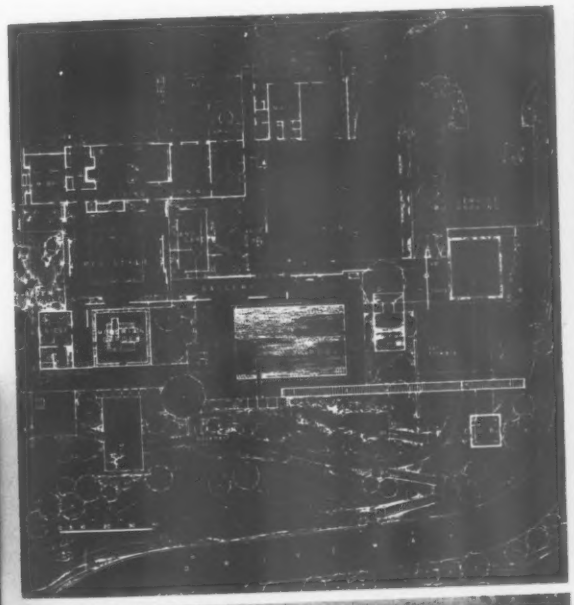


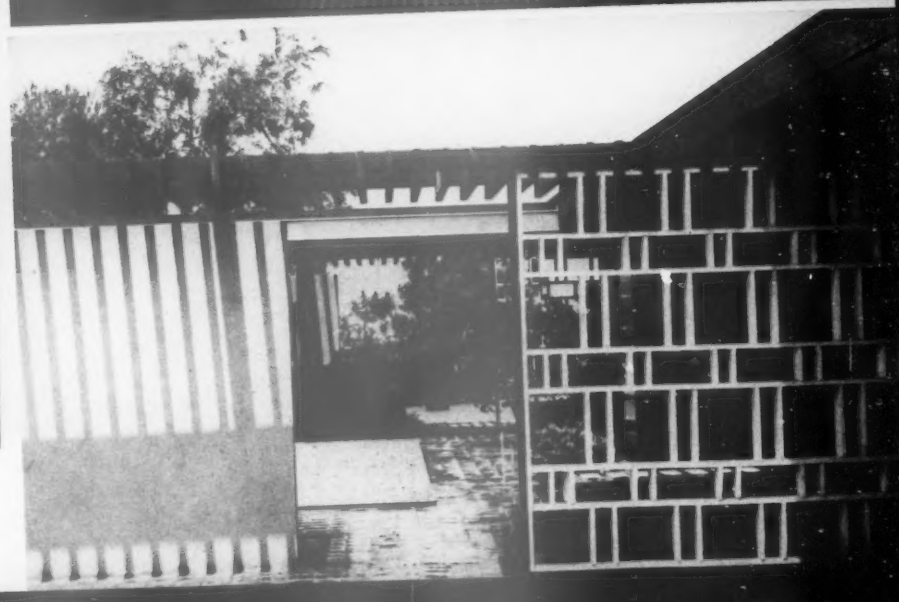
Above, model and diagrams of the Adams house, Sarasota, Florida. The house is of reinforced concrete on a large square base. The first floor is an entrance space over the swimming pool with a screen porch beyond. The upper floor has a square well through which the stair runs, and contains living-room and bedrooms, each with a terrace.

Thornton Ladd was born in Portland, Oregon, in 1924, and spent his childhood in Oregon and California. His chief interest was music, but at twenty-two he decided he hadn't sufficient aptitude for it and chose architecture, which he studied at the University of Southern California, afterwards working for a general contractor, and then in the offices of two architects. He now has two offices, in Santa Barbara and Pasadena, with a total staff of ten. The predominant aim of his office is to integrate architecture, interior design and landscape design into a single creative process, and in most of his work these three are carried through under his own close supervision.

The Parker Lyon house, showing a connecting corridor on the upper level.

Above and bottom left (also bottom of facing page), studio in the garden of the Thornton Ladd house at Pasadena, California. In the plan, below, the studio is situated just below the drive at the foot of the drawing; it has a timber frame with fixed glass walls and sliding sun-control panels. The three views on the right are of the house and garden at the top of the hill and show, reading from the top, peristyle from entrance; the sand garden, with dining-room beyond; the peristyle from the sand garden: they reveal Thornton Ladd's successful attempt in this house to link the rooms of the house with a series of courtyard gardens, each possessing a different character and effect, though linked together to provide a consistent progression.

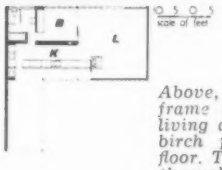




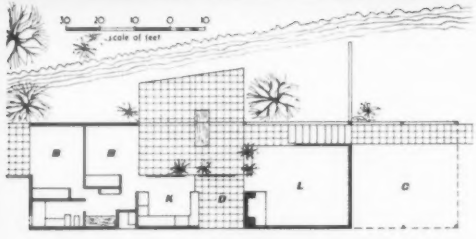
32

Los Angeles, California

Pierre Koenig was born in San Francisco in 1925 and studied architecture at the University of Southern California, where he qualified in 1952. He has since taught at the University and worked in the office of Raphael Soriano. He built his first steel frame house in 1951 and has been designing them ever since; he has just won the 1957 House and Home award for residential design.



Above, Koenig's own house in Los Angeles. The main frame and windows are all of steel. Top right, the living area, with glass doors leading to a back patio; birch panelling on the end wall and asphalt-tiled floor. The steel roof deck is exposed on the underside throughout the house. Below and right, house at Glendale, California. The frame again is steel, and the siding consists of galvanized steel sheets fastened in steel channels and painted light blue.



3

AMERICAN ARCHITECTURE IN WORLD PERSPECTIVE

MATRIX

'. . . It is not merely that in the cultures of Europe and of the Orient the American artist can find no antecedent scheme, no structural plan, no body of tradition that can give his own work the validity and truth that it must have. It is not merely that he must make somehow a new tradition for himself, derived from his own life and from the enormous space and energy of American life, the structure of his own design; it is not merely that he is confronted by these problems; it is even more than this, that the labor of a complete and whole articulation, the discovery of an entire universe and of a complete language, is the task that lies before him . . . ' from *The Story of a Novel* by Katherine Anne Porter.

For the American architect the task of discovering 'an entire universe and . . . a complete language' is a task he has shared with trail-blazers of the modern movement everywhere; it was just this that the new architecture demanded of its practitioners whether in the old world or the new. The collective achievement in roughly fifty years is a partial universe and an incomplete language, but it is no mean one in face of the task.

It has been a gargantuan struggle and nothing less, as prizes, than a new-made world and a new language of vision could have fired it. Neither could it have won out this far unless it had been an international effort free of tariff-bound intellects—hence the echoes of Marseilles in Brixton, of Chicago in Amsterdam and Tokio, of Berlin in Chicago and San Francisco, of Nantes in Rio de Janeiro and of Ronchamp in South Wales.

The movement has been remarkable for the number of prophets without honour in their own countries whose prophecies have served to awaken others. Sometimes the honour due to a foreign prophet has been over-paid or paid in bad currency, but the act has seldom been quite valueless. Unexpectedly those countries which have altogether turned

their backs on their own have (through forcing cross-fertilization) done, perhaps, the most valuable service of all.

The circumstances of life within and between nations, the push and pull of politics, the heavy swell of economics, the coming and going of the mysterious stranger—culture, have in turn and together made their presence felt in modern architecture. Achievement and the focus of interest have shifted from Germany to Russia, from Sweden to Brazil, from Italy to America and through it all two lone voices have emanated with unwavering intensity out of Paris and Chicago—the voices of Le Corbusier and Frank Lloyd Wright.

Both of these men are great propagandists and as architects great individualists. The very nature of their genius has limited their direct influence, for in common with all great men of their kind, it is their individuality we value, and though we may moan the scarcity of great individuals, the very nature of the thing precludes emulation. Their vigour, their all-embracing enthusiasm, their scale we may admire and emulate; their personal visions may arouse others to feats of imagination they would not have achieved without them, but their architectural handwriting is their very own, and attempts to follow it too closely can only lead to caricature.

We are indebted to them for the fearless prospecting they have done, for the routes they have laid, along which others may follow to make their own discoveries. It would be a mistake, though, to think that this is the way of the many, these are not metalled roads designed to carry a machine civilization (though they may occasionally have been given a mechanical gloss). No, they are ways for those prepared to get their feet wet and labour to push the track that much further into virgin territory—the way of the artist.

Who, then, blaze the way for the rest? Again two men—Walter Gropius and Mies van der Rohe; the first, tireless as a teacher, team-worker and, again, propagandist, but this time a propagandist for a machine civilization, an anonymous architecture and the methods of working that are best suited to it; the second, a poet in architecture of all that the teachings of the first imply. Not that Walter Gropius has failed to give substance to his beliefs, far from it; he has been first in the field in so many things that it would take too much space to list them. But he of all contemporary architectural propagandists has thought most deeply about the implications of technology in building, with all the side issues they raise for the profession, the building industry and the community.

The plea for standardization and teamwork does not attract unanimous support, it does not, for instance, appeal to the genius or even the gifted individualist. Their reaction to the spread of standardization, their inability to see the outcome of it as architecture at all, is understandable for, according to their own definition, it isn't. The argument that there are not enough artist-architects to go round and that means must be devised to get decent buildings efficiently and economically built in sufficient quantity notwithstanding, makes little appeal to them. But the task of providing a decent environment by raising the level of the average is urgent, and though it is vital for some people to keep their eyes on the peaks, removing them from time to time, perhaps, to observe how small the foothills are, it would be a disastrous attitude for the majority (though the eyes of the majority, it is true, are fixed rather too often on their feet).

Most of the remaining opposition centres round vague, though sometimes powerful, feelings of unease about mechanization in general. The abiding influence of William

Morris and John Ruskin, to mention only two whose hackles rose to powerful effect at the thought of a mechanical civilization, is greater than we often realize. It is not that one fails to sympathize with their reaction, given the peculiarly unpleasant first impact of mechanization on their communities; but surely there should be less sympathy for those today who rise whinnying on their haunches, because with them reaction stems more from fear and the wish to be blinkered from reality. Reality it is, whether we like it or not, and we might just as well learn to like it. Mechanization is part of almost every detail of our lives from the mechanical brain to the 'untouched-by-hand cake mix' (see cover): already it has its poets and its painters; an architect like Mies, a painter like the late Jackson Pollock (action painting has a very direct relationship), the new kind of artist-technician like Charles Eames, all give witness to the credit side of the balance (putting material benefits on the debit side as, I suppose, in the light of the highest ideals you should). It has its popular art, no less fascinating and instructive, perhaps, for being on the debit side (in the light of the highest ideals). The cover of this issue is an example of an artist using a popular aspect of mechanization (coloured advertising) as the raw material of his art. It is easy to decry the strange, and often suggestive, shapes of the latest American cars, it is harder to laugh off, except in pure snobbery, the genuine enthusiasm and excitement they generate. We are fond of explaining that modern architecture is still in its infancy, that the maturing process is always a long one; is it not possible that this may also apply to popular art, however different the methods by which it is produced?

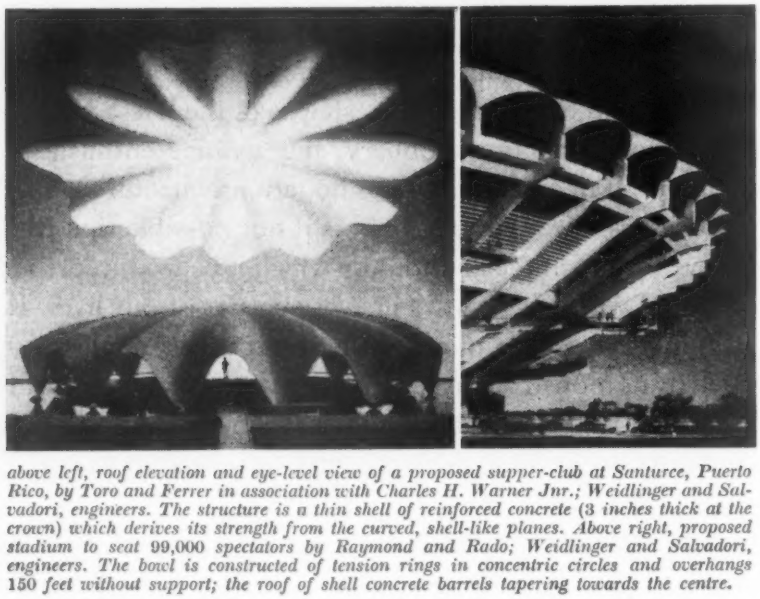
Mechanization is exciting and packed with possibilities in every corner of our lives. It would be encouraging if we in Britain were a little more brash about it; we might be a little less in danger of being engulfed by its monstrous aspects if we were; we don't laugh at it or with it enough and we haven't house-trained it. The comforts it can bring give us uncomfortable feelings; the new kinds of education it demands find us reluctant to make changes; its appearance seems to be in 'bad taste'.

America does not suffer from these inhibitions; it has kept its very real feelings of guilt well-reined in the matter, some might say it makes its peace with the gods through dramatic gestures of generosity (if such they are, then it should go on record as the most intelligent sacrificial ritual in history). Of course America is not free from fear of the possible consequences (a little fear in this department can be a life-saver), nor is it free of laggardness in adapting itself (cf. architectural education and the landscape), but the willingness is there and the right kind of brashness is there.

It is this that has made America the first country to pioneer industrialized building on a large scale, and it is the atmosphere of confidence and excitement that surrounds America's mechanical age that stimulates the imagination of its creative architects. Other reasons for the quality of the contribution they are beginning to make have been given already. Nobody visiting America can fail to be struck by the heightened awareness that the belief in your own power to mould the present can give. Architecture is, perhaps, the best touchstone of this, for where art, science and technology are channelled through imagination, as they are in architecture, when each has to pay a degree of homage to the other, then they can be judged by the man of average intelligence and general knowledge. Their esoteric nature, taken separately, due in science and technology to the specialized know-

ledge necessary to master them and in the arts to their function as surveyors of new and unfamilar territory, tends to cold-shoulder the average man.

The almost inescapable duty of the architect to make his artefacts not only comprehensible but also usable comes clearly through the preceding biographies of American architects. They are men in most of whose lives, both through necessity and temperament, the ivory tower is situated in close and well-planned proximity to the market-place. They are lives, one realizes in reading them, with more than their share of uncertainty, drama and reward. What also comes through very clearly is that the kind of trail-blazing these architects do cannot but be the preserve of the especially adventurous and the especially gifted. The changes and chances of their lot are many; the struggle to acquire the knowledge for qualification, often against severe financial odds; the breakaway from the safe job to found a practice; the difficulties and coincidences attendant upon obtaining commissions; the close connection with an industry vulnerable to even quite small economic recessions; however, when all this is added to the positive qualities the art demands, the result can be a remarkable and many-sided human being.

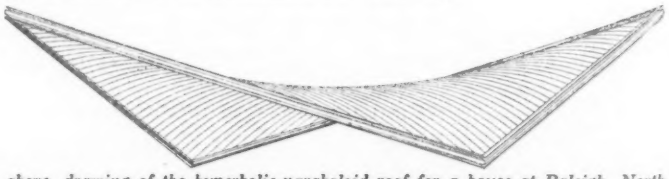


above left, roof elevation and eye-level view of a proposed supper-club at Santurce, Puerto Rico, by Toro and Ferrer in association with Charles H. Warner Jnr.; Weidlinger and Salvadori, engineers. The structure is a thin shell of reinforced concrete (3 inches thick at the crown) which derives its strength from the curved, shell-like planes. Above right, proposed stadium to seat 99,000 spectators by Raymond and Rado; Weidlinger and Salvadori, engineers. The bowl is constructed of tension rings in concentric circles and overhangs 150 feet without support; the roof of shell concrete barrels tapering towards the centre.

To an outsider, the concern of this kind of American architect for enlarging the vocabulary of design and its range of expression to meet different needs, seems to fall into three main categories:

1. The development of new structural systems worked out in collaboration with engineers, many of them concerned at present with roofs.
2. The correlation of new buildings with their setting, where this is considered worthy.
3. The opportunities provided by new building techniques and methods of assembly, with particular reference to the aesthetic potentialities of the curtain wall.

The American architect's enthusiasm for the structural possibilities of shell concrete and the space-frame has attracted biting criticism.[1] Certainly his enthusiasm has, at times, o'erleapt some very large spaces that could just as well have been subdivided structurally, to the greater benefit of

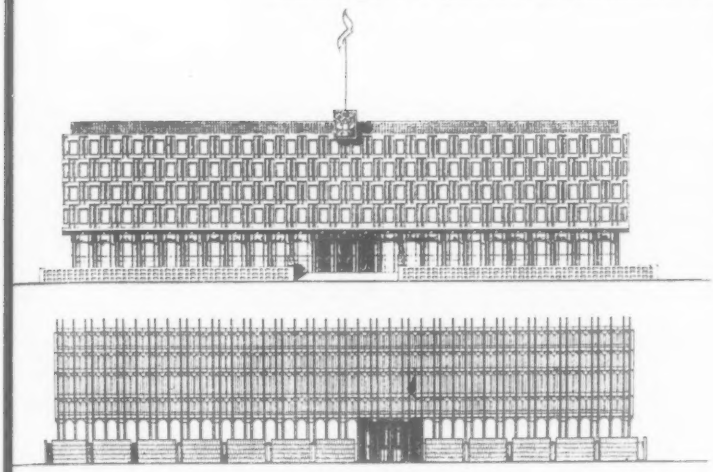


above, drawing of the hyperbolic-paraboloid roof for a house at Raleigh, North Carolina, by Eduardo Catalano; Atilio Gallo, engineer. The main advantages of a warped plane of this kind are 1, though doubly curved it can be made of straight members; 2, all stresses are equal (no bending moment); 3, stresses are calculable; 4, it is very rigid. Below, restaurant and supper-club, bottom, concert pavilion; both part of a master-plan for Long Beach, California, by Raymond and Rado; David Leavitt, Associate. The structure of the restaurant is a concrete hyperbolic-paraboloid shell composed of three diamond-shaped arches springing from three steel pivots. The concert pavilion is a double arched concrete canopy springing from two points in the ground.

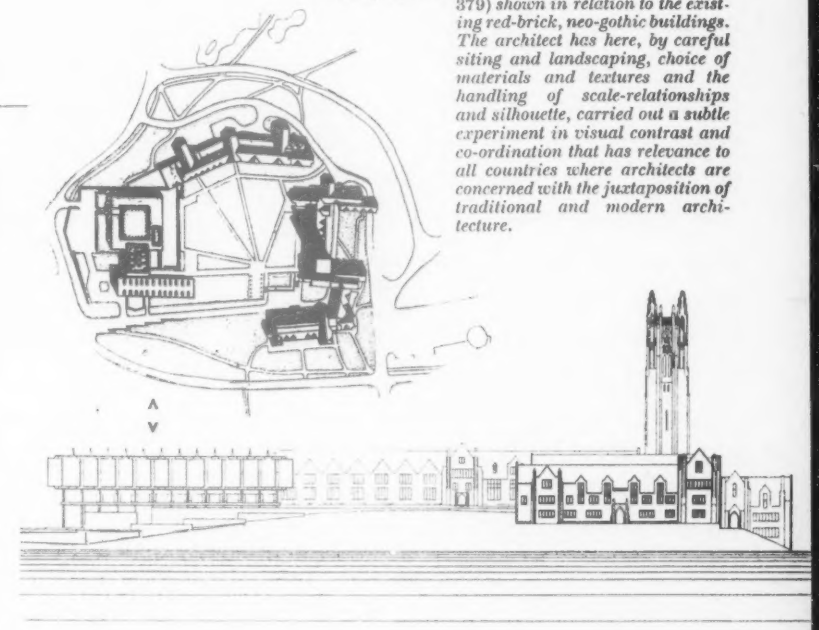
[1] *Architecture—Art or Design?* by Sibyl Moholy-Nagy. *Progressive Architecture*. January, 1957.

function and effect. If he has sometimes failed to grasp the full significance of new engineering devices or has, on balance, given them too much significance, may this not merely be a concomitant of their novelty? An excess of enthusiasm which drives out reason is no doubt evidence of immaturity and hard to tolerate for long, but it often signifies a healthy adolescence—a period of rapid growth. It is perhaps wise, therefore, not to be over-critical when, in so many countries, modern architecture has lately given concern more for its lack than for its excess of enthusiasm.

The concern of the American architect to investigate the problems that arise when new buildings are placed in intimate relationship with old ones is a more strictly architectural facet of that concern for regional differentiation which is now declining. The desire to foster and develop regional distinctions is beginning to be recognized as a matter of nostalgia and Babbitism and out of rhythm with recent trends. However, where a new building is planned in close proximity to old ones the desire to take account, in specifically visual terms, of an existing set of conditions of scale, colour, texture, pattern and form is surely a sign of maturity, a realization that buildings cannot always be considered to exist in a vacuum[2]. Literary and romantic associations may sometimes enter into this process, but as the confidence of the modern architect develops, such problems will, no doubt, be solved without their aid. He may still find relevant answers in the past to visual conundrums of proportion, scale relationships and suchlike; though even here an intensely perceptive and cultivated intelligence is the only safeguard against lapses into plagiarism and slackness of invention.



top, final version of the east elevation of the winning design for a US London Embassy, by Eero Saarinen. Above, the same elevation from the design by Minoru Yamasaki. As with many recent buildings by American architects abroad, both these designs take into account the architectural genius loci, the first Georgian proportion, the second, Early Victorian Gothic; neither are in any sense plagiarist, for though the desire to reminisce may have dictated the choice of structural system, the proportions are a logical expression of the system chosen and both systems are of recent development.



left, plan, and below, south elevation, of the new Arts Centre for Wellesley College, Massachusetts, by Paul Rudolph (for full credits and further illustrations see p. 379) shown in relation to the existing red-brick, neo-gothic buildings. The architect has here, by careful siting and landscaping, choice of materials and textures and the handling of scale-relationships and silhouette, carried out a subtle experiment in visual contrast and co-ordination that has relevance to all countries where architects are concerned with the juxtaposition of traditional and modern architecture.

The attention paid to the aesthetic potentialities of the curtain wall has already been considered in some detail. It is in this field that American architects have made themselves

[2] The two designs, above, for a US embassy in Grosvenor Square, London, are an example of a traditional setting (Georgian, and Gothic Revival London) providing inspiration for the proportioning of façades which at the same time derive logically from contemporary methods of construction. Ironically the existing buildings in Grosvenor Square are not really worthy of this display of architectural good-manners.

most strongly felt abroad, and since the curtain wall is something which, quite apart from its commercial aspects, is clearly felt to be in tune with the zeitgeist, the study being lavished on it will almost certainly lead to interesting new developments.

In what ways, then, is American architecture contributing to what Katherine Anne Porter described as a 'new universe . . . and a complete language' specifically American? Does the situation today favour a national idiom in architecture? Certainly in the sphere of standardized, and largely anonymous architecture, national differences are tending to be ironed out; industrialized building, with its origins in Europe and its adolescence in America, may finally become truly international; for when it is efficiently exploited and when, and if, tariff barriers come down, buildings will come through as well as motor cars and refrigerators.

Though regional distinctions are disappearing from architecture[3] it seems unlikely, at least in the immediate future, that all national differences will disappear also—even in those countries with close cultural links within the western world. For, though the creative architect may, and indeed nearly always has, ignored frontiers, where the individual instead of the machine produces the one-off instead of the standard part, all the precious vagaries of personality come into play, and these are, and no doubt long will be, derived from the cultural heritages of nations and regions, from varied educational systems, from a man's situation in his community and from many other factors all of which, fortunately, make for difference and variety. When the pull of national and regional loyalties is weakened, as it has begun to be between some nations and many regions in recent years, and when mechanical devices are widely enough developed to counter-balance the effect of climate on architecture (as they already are in America[4]), then we will see the contribution they make to architectural variety weaken also. There will be little reason to lament their passing, for they are not the vital preconditions of creative endeavour that freedom of expression, access to materials and absence from molestation are: variety can flourish perfectly well without them, only it will not be a distinctively national and regional variety; as influences these factors will count for less.

Meanwhile, as the preceding pages have shown, much American architecture does have a distinctly American flavour (the San Francisco Bay area being one of the few regions that shows marked, though waning, local flavour). It cannot be said that Katherine Anne Porter's dream of American writers discovering a new universe and language has been fulfilled by its architects, or that it was ever desirable it should be; there is little doubt that 'the cultures of Europe and the Orient have provided antecedent schemes', but when these are assimilated as, with a few exceptions, they are being, the achievement will be truly American, and its contribution to the common cause of 'a new universe and language' of architecture may well prove decisive.

[3] and [4] The waning influence of the regional vernacular and of the effects of climate on American architecture was testified to by numerous architects in their answers to the questionnaire which formed the basis of the preceding biographies.

acknowledgments

MARGINALIA, pages 291, 292: 1, 'Architectural Forum'; 2, Truscon Steel Company; 3, Stephens Tru-sonic Inc.; 4, 11, 13, 'Life'; 5, 'Styling: the look of things' (General Motors); 6, Stoeger Arms Corporation; 7, 'Car Life'; 8, 'Interiors'; 9, 'The Columbus Citizen'; 10, 12, 'Los Angeles Examiner/Pictorial Living'; 14, Massachusetts Institute of Technology; 15, 'Mad Magazine'; 16, F. W. Seiders; 17, American Concrete Institute; 18, 'Newsweek'. SYNTAX, page 208: 1 and 2, Michael Brawne; page 303: 3 and 4, Eric de Maré; page 304: 5, Courtauld Institute; 7, Ian McCallum, Arphot; 8, F. R. Yerbury; page 305: 12, Ian McCallum, Arphot; 14, W. E. Tatton Brown; page 306: 18, Edward D. Mills; 23, Dell and Wainwright; page 307: Barbican, 'The Times'; Kaufhof, Ian McCallum, Arphot; page 309: 1–5, W. E. Tatton Brown; page 310: 6, Michael Brawne; page 311: 9, E. C. Valastro; 10, Ezra Stoller; vertical, Ian McCallum, Arphot; page 312: vertical, Louis B. Schlivek; 12, 14, Edward D. Mills; 13, 'Progressive Architecture'; page 313: 15, J. Alex Langley; 16, 'Architectural Record'; page 314: vertical, Ian McCallum, Arphot; 18, 'Architectural Forum'; page 316: vertical and 21, Photographic, Detroit; 22 and 23, Lionel Freedman; page 319: 24, Aluminium Company of America; vertical, Jay-Bee Studio; 26, 'Aluminium on the Skyline'; page 320: 27, Todd Webb; page 324: 30 and 31, Ian McCallum, Arphot; 33, W. E. Tatton Brown; page 325: 34, Gordon Sommers; 35 and 36, Lawrence S. Williams; 37, Ezra Stoller; page 326: 39, Pontiac Photo Studio; 40, Galfas Studios; 43, Robert M. Garrick; 44, Ezra Stoller; 46 and 47, Douglas M. Simmonds; page 327: 49, Ulrig Meisel; page 328: 53, Reynolds Photography Inc.; 54, Hedrich-Blessing; 55, L. D. Jones; 56, Lawrence S. Williams; page 329: 57, Hedrich-Blessing; 58 and 59, W. E. Tatton Brown; page 330: 61, Hedrich-Blessing; 62, William H. Olsen; 63, F. W. Seiders; page 331: 64, W. E. Tatton Brown; 65, Hal Rumel; 66 and 67, Peter Fish Studios; page 332: 70, F. W. Seiders; 71, Frank Lotz Miller; 72, Marvin Rand; 73, Lawrence S. Williams; 74, Hedrich-Blessing; page 333: 75–78, Alexandre Georges.

GENETRIX *Mies van der Rohe*, page 338: left, Berko; bottom, W. E. Tatton Brown; page 339: top left, W. E. Tatton Brown; bottom left, Ian McCallum, Arphot; rest, Bill Engdahl, Hedrich-Blessing. *Richard Neutra*, page 340–341: bottom left, Ian McCallum, Arphot; rest, Julius Shulman. *William Wurster*, page 341: top and middle, Roger Sturtevant; bottom and page 342, Morley Baer. *William Lescaze*, page 342: bottom left, Ben Schnall; bottom right, Joseph W. Monitor. *Pietro Belluschi*, page 343: top centre upper, Rondal Partridge; top centre lower, Roger Sturtevant; bottom left and right, Northwest Photographic Illustrators. *Louis Kahn*, page 345: two bottom left, John Ebstel. *Mario Corbett*, page 346: middle centre, lower centre, right, Dean Stone/Hugo Steccati. *Edward Stone*, page 346: top left, Blitze Sapec. *Marcel Breuer*, page 348: top left, Homer Page; top right, Rufus Stillman; left and right upper centre, Ben Schnall; left and right lower centre, Warren Reynolds Infinity Inc.; bottom, Ben Schnall; page 349: top, both Ben Schnall; bottom left, Frits Monshouwer. *Victor Gruen*, page 349: centre, Ezra Stoller; top and bottom left, Gordon Sommers; page 350: top, York Photographic Studios; centre left, Warren Reynolds Infinity Inc.; centre right, Morley Baer; bottom, Gordon Sommers. *Paul Schweikher*, page 351: top left and right, Hedrich-Blessing; bottom left, Joseph Molitor; bottom right, Frank Lotz Miller; page 352: top, Hedrich-Blessing; bottom left and right, Shapiro. *Bruce Goff*, page 352: centre, top and bottom left, Hedrich-Blessing; page 353: top three right, 'L'Architecture d'Aujourd'hui'; top centre, Philip Welch; bottom left and right, 'Architectural Forum.' *Philip Johnson*, page 354: top right, Ezra Stoller; bottom left and right, Louis Checkman; page 355: all Ezra Stoller. *Robert E. Alexander*, page 356: upper and lower right, Julius Shulman. *Rafael Soriano*, page 356: top left, Elizabeth Soriano; rest, Julius Shulman; page 357: top right and left, centre left, Julius Shulman; centre right, Ernest Braun; rest, Julius Shulman. *Vernon De Mars*, page 358: bottom right, Roy Flamm; Gordon Bunshaft, page 358: top left, Ferdinand

Vogel; page 359: top, Ezra Stoller; centre left, Michael Brawne. *John Rex*, page 359: bottom three, Julius Shulman. *Eero Saarinen*, page 360: top left, 'Vogue'; centre, Yale News Bureau; bottom left, Robert D. Harvey Studio; bottom right, Hedrich-Blessing; page 361: top, Yale News Bureau. *Eliot Noyes*, page 362: top and centre left, Ezra Stoller; centre middle, Ben Schnall; centre right, André Kertész; lower centre, Ezra Stoller; bottom left, Eliot Noyes and Associates. *Whitney Smith*, page 363: top centre, James H. Reed; rest, Julius Shulman; page 364: both, Julius Shulman. *Ernest Kump*, page 364: top left, Skelton Studios; bottom left and right, Roger Sturtevant. *Hugh Stubbins*, page 365: top, Richard Garrison; page 366: top and bottom left, Roger D. Harvey Studio; right, Robert C. Lautman. *Minoru Yamasaki*, page 366: right, Bill Hedrich, Hedrich-Blessing; page 367: bottom, Bill Hedrich, Hedrich-Blessing; rest, Lens-Art Photo; page 368: left, Bradford La Rive; right, Ezra Stoller. *A. Quincy Jones*, page 368: top left, 'House & Home'; top right, Dale Healy; centre and bottom, Julius Shulman. *T.A.C.*, page 370: top left, Walter R. Fleischer; bottom, Robert D. Harvey Studio. *Ralph Rapson*, page 372: centre, Hedrich-Blessing. *Edward L. Barnes*, page 372: top right, Ben Schnall; page 373: top, Ben Schnall; lower centre, Ezra Stoller; bottom left, right, centre, Ben Schnall. *Harry Weese*, page 374: top right, Hedrich-Blessing; bottom left, Bill Engdahl, Hedrich-Blessing; bottom right, Chicago Architectural Photographing Company. *John MacL. Johansen*, page 375: top left, Hans Namuth; top right and centre right, E. J. Cyr; page 376: left and right, Ezra Stoller. *I. M. Pei*, page 376; top left, Cincinnatti Art Museum; top right, Louis R. Glessmann; bottom left, 'Architectural Forum'; page 377: top left, Ralph Steiner; top centre and lower centre, Ezra Stoller; bottom left and right, Lionel Freedman. *King Lui-Wu*, page 378: top left, Jane Doggett; top right and centre left, King Lui-Wu; bottom left and bottom right, S. A. W. Hicks. *Paul Rudolph*, page 378: left, Fred Stone; page 379: bottom left, Lionel Freedman; bottom right, Ezra Stoller. *Roger Lee*, page 380: top left and right, Ernest Braun; rest, Roger Sturtevant. *Peter Blake*, page 381: bottom three, Hans Namuth. *Ulrich Franzen*, page 382: top left, Elliott Erwitt; rest, Ezra Stoller. *Thornton Ladd*, page 384: top, Julius Shulman. *Pierre Koenig*, page 386: all Julius Shulman.

MATRIX, page 392: Supper Club by Charles H. Warner, Jnr., Universal Atlas Cement Company; Stadium by Raymond & Rado, 'Architectural Record'; Roof structure by Eduardo Catalano; Long Beach Development by Ramond & Rado, 'Arts and Architecture.' Page 393, U.S. London Embassy: Saarinen; Yamasaki; Wellesley College designs by Paul Rudolph.

The following architects kindly supplied material for publication on pages 323–334 in this special issue:

Alexander & Rothschild; Anderson, Beckwith & Haible; Copeland, Novak & Israel; Curtis & Davis; deYoung, Moscowitz & Rosenberg; Flatow, Moore, Bryan & Fairburn; Foley, Hackler, Thompson & Lee; Kenneth Franzheim; Golemon & Rolfe; Harrison & Abramovitz; Kivett & Myers & McCallum; Vincent G. Kling; MacConnell & Walker; Mitchell & Ritchey; Perkins & Will; Emery Roth & Sons; Shaw, Metz & Dolio; Sherlock, Smith & Adams; Skidmore, Owings & Merrill; William B. Tabler; Thorshov & Cerny Inc.; Welton Becket & Associates.

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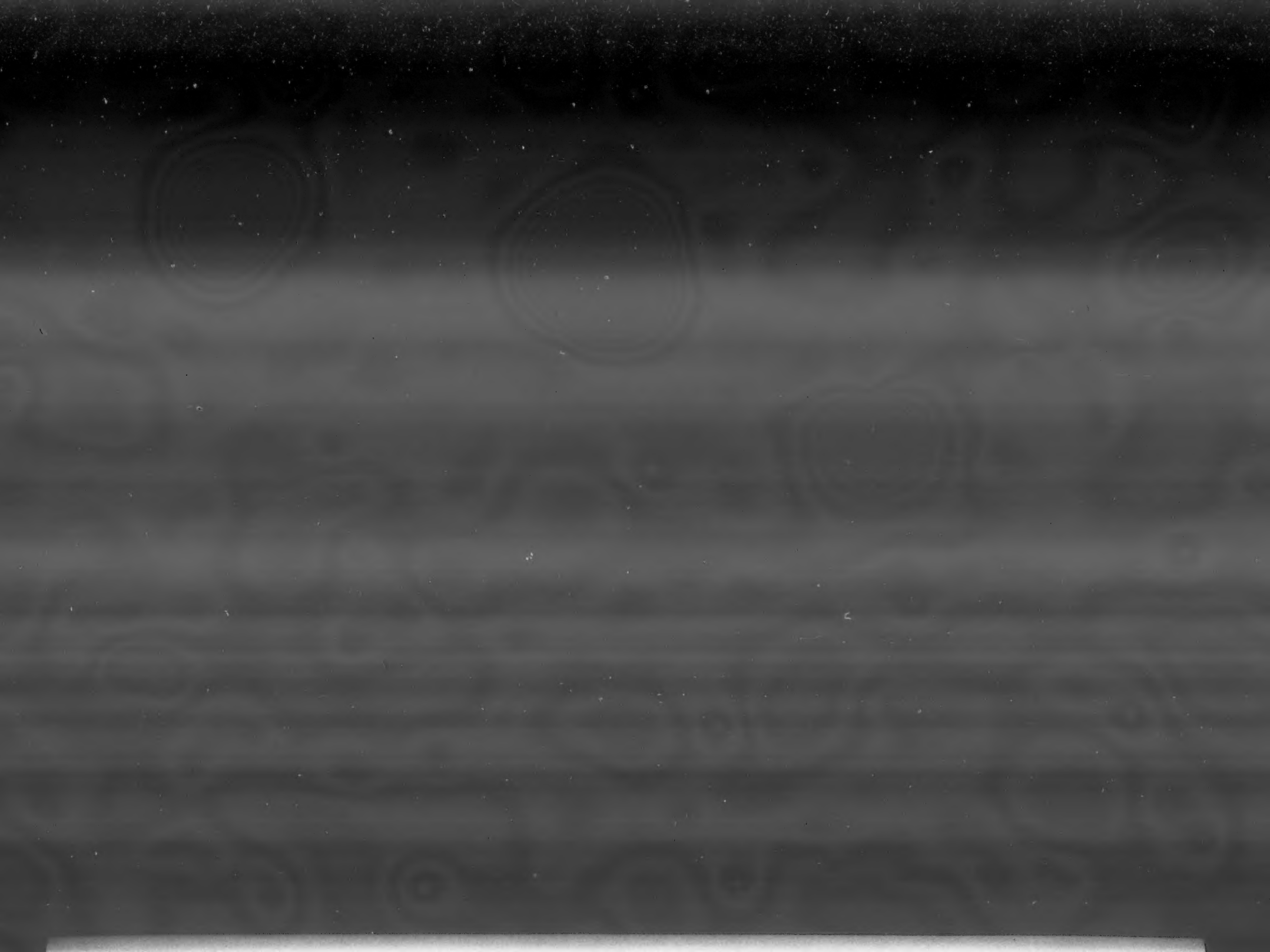

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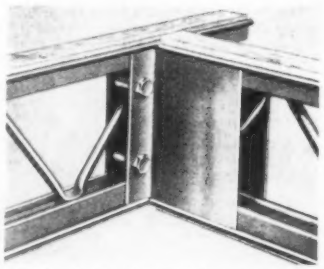
Steel Floors and Wiring Ducts

Until we have more sensitive and efficient costing control for the profession it is very hard indeed for the architect to evaluate the different systems of proprietary flooring now on the market, since their worth is not merely intrinsic (i.e. materials used and labour in fixing), but is to be assessed only in terms of the whole building operation and by taking into account the time saved or lost by other trades.

For this reason we cannot usefully comment on the economy of the Robertson Q-Floor system, apart perhaps from pointing out that it has been developed with this kind of incidental saving in mind and deserves special attention on this account. One aspect of the system which may not be so well known as some, is that of electrical wiring. By running steel header ducts at right angles to the line of ducts which are formed by the steel reinforcement it is possible to provide a complete grid of ducts under an office floor at very small extra cost. Though there is some doubt about the value of movable partitions in an office, there is much less about the need for movable telephone outlets. The knowledge that beneath an office floor there is a grid of ducts which can be tapped (by means of special tools) at any position in one direction and at frequent, predetermined intervals in the other is likely to prove a real comfort.

Robertson Thain Ltd., Ellesmere Port, Wirral, Cheshire.



Junction detail of the nailable truss made by Metal Sections Ltd.

The Advancement of Slate

A classic example of how a building material may worm its way into architects' vernacular by good trade literature is afforded by Bow Slate. Though it is probable that a few architects would have 'found' slate for themselves, it would never have become the *cliche* which it is now (on the whole a good *cliche*, we hasten to add) were it not for the series of Information Sheets in the *Architects' Journal*. These are now available in a pocket folder which also illustrates uses of slate which have not yet been covered in 'sheets': fireplaces, balance stands, outsize sinks for laboratories, the traditional larder shelving and skirtings.

The Bow Slate & Enamel Co. Ltd., Old Ford Road, London, E.3.

Multi-Coloured Paint.

Readers of American papers during the last few years will have noticed the fairly frequent use of multi-coloured paint: of paint surfaces composed of tiny flecks of different colours in the manner of a Seurat. The resulting surface has a different visual quality from an ordinary paint surface and resembles rather that which you get with certain types of cement paint. This product is now available over here under the trade name Policrome. Though the range of colours (i.e. the range of colour effects produced by the various mixtures) is limited, the material has certain remarkable qualities which no architect can ignore. Invariably sprayed, it has an excellent coverage: it needs only a single coat and can be sprayed direct on a wide variety of surfaces (among them concrete, wood and building boards) without sealer or primer. More important still is its ability to marry up dissimilar surfaces to give a unified effect. This is because though *physically* Policrome is a smooth paint film, *visually* it is a texture.

It is very hard wearing, but if a surface should become scratched it can be easily painted over and matched up. Though it has been used as an external finish in America, the English manufacturers are not yet convinced that it will stand up to the English climate, and for this reason recommend it for internal use only.

International Paints Ltd., Grosvenor Gardens House, Grosvenor Gardens, S.W.1.

What is the Colour of a Brick Wall?

Though a colour photograph is on the whole a rather dubious friend to the architect, we must draw attention to an exceptional use which has been made of it by Eastwoods Ltd., to show the effect of their bricks when built into walls. This takes the form of a series of sheets of art paper 11 in. by 8¼ in., on the face of which is printed a colour photograph of a piece of walling (sunlit, of course!) to rather less than half full size. We can imagine endless discussion in the office about whether they are objec-

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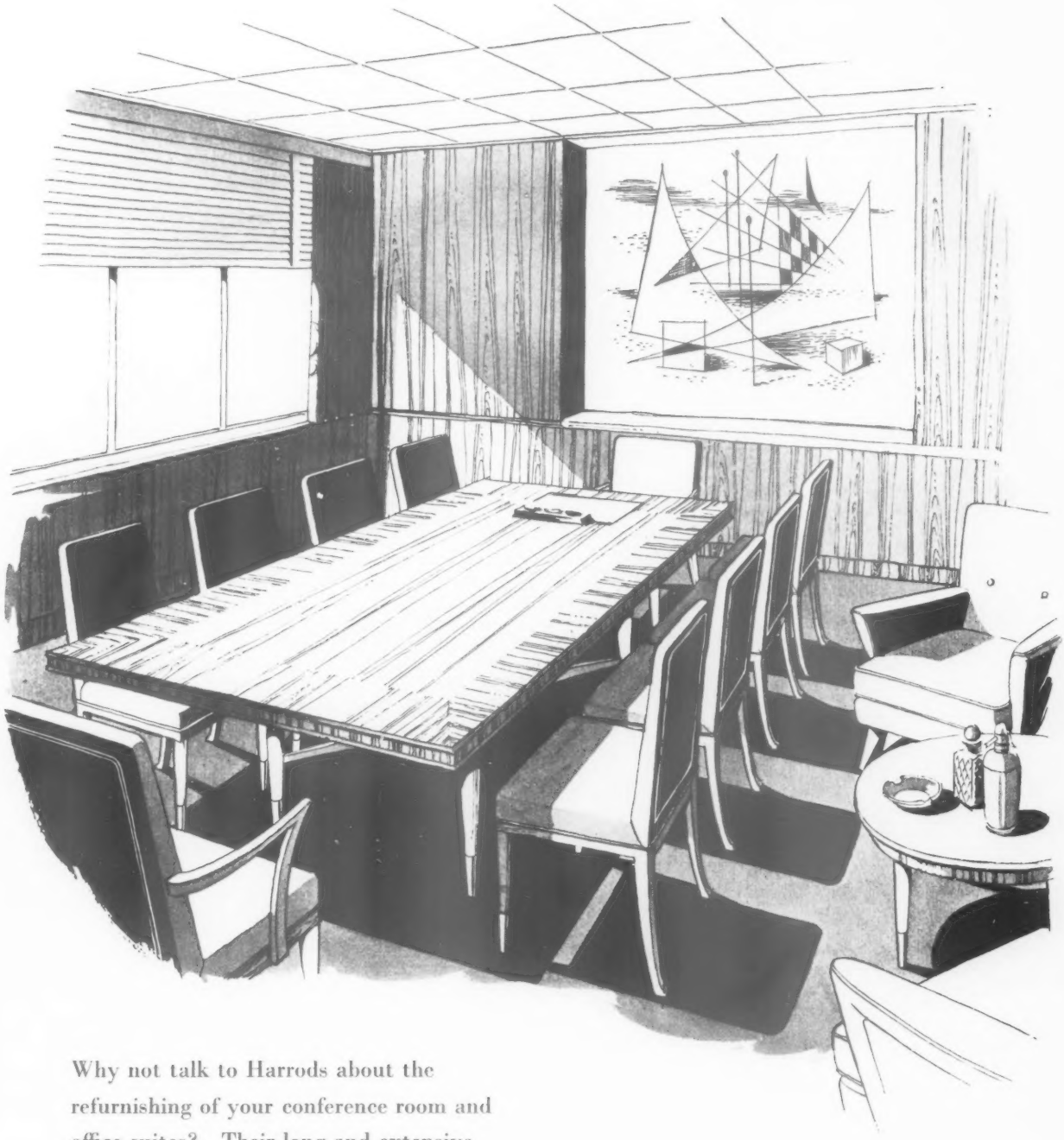

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tive evidence of the finished appearance of a wall; but it is certain that they are very useful in bringing home the difference between bricks of the same class. When it is a matter, for instance (to quote three actual sheets in the set), of visualizing the difference between 'yellow stock facing bricks,' 'mild stock facing bricks,' and 'second hard stock bricks.' The series would be even more useful if the mortar used in the photographs was specified, also the strength of the brick, and if some indication were given of the price.

Eastwoods Ltd., Eastwood House, 158-160 City Road, London, E.C.1.

Asbestos in Building.

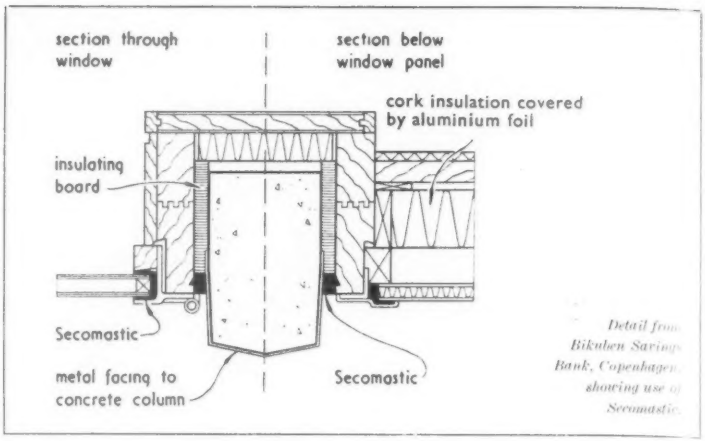
In October last Editions Girsberger of Zürich completed their first year of publication of their new quarterly *International Asbestos-Cement Review*. We do not know whose idea it was to devote a periodical to the use of asbestos cement, nor what is the precise share (if any) of the asbestos cement industry in the project; but the idea itself was a good one, and even if the object of the venture is what we describe as 'promotional' the standard of the first four publications is so high that even if the nigger *is* in the woodpile you can't see him. For it has the character of a publication which has been compiled chiefly from the contributions of good architects for the use of other good architects.

Asbestos cement is a material which first came into use as a cheap cladding, and, in this country, has not yet outlived the stigma of unconsidered usage. For if its associations are not particularly grateful to English architects this is not so much on account of its inherent quality (or lack of it) but because it has been developed over here without regard for visual standards. As can be seen from this quarterly, the best users of asbestos cement are the Germans: perhaps because they have an inborn respect for economy in the real sense and because they alone have a convincing mystique for the class of buildings—factories—on which it has been most used.

We hope English architects will buy this quarterly—it costs 5s. a copy, the English agents being B. T. Batsford Ltd., 15 North Audley Street, W.1—and we hope still more that they will rub the nose of every English asbestos cement traveller in it.

Secomastic Forum

Few forms of trade advertising are less welcome to the serious Architect than the kind which shows little more than photographs of the buildings on which the advertiser's product has been used. Though it belongs in this category, he will find a new periodical published by Secomastic Ltd., entitled *Secomastic Forum*, more interesting than most, perhaps because the material itself has grown up with modern building techniques and has therefore been used on a large proportion of the key modern buildings. Particular faith seems to have been pinned on it by good architects practising in Scandinavia: Ralph Erskine used it to point his large precast concrete panels in the flats at Vaxjo, Frits Schlegel to close a very tricky metal wood insulating board junction on the cladding of his 'Bikuben' Savings Bank in Copenhagen, and Arne Jacobsen seems to have used it in almost every possible position in his Town Hall at Rodovre. Nobody knows how long any building mastic is going to last. The right attitude seems to be to think of it as a replaceable item in a building's protection, with a life which where exposed is much longer indeed than that of paint but shorter, perhaps, than that of mortar pointing in traditional construction. Since it commonly covers the joins between large walling units the foot run per unit area for replacement is not great, and since Secomastic at least is applied with a neat and rapid tool, its use in this way should not prove uneconomic. In this connection it is interesting to note that it was used to replace leaking mortar joints between precast granite blocks in that sad lump, the G.P.O. at Cape Town.



Detail from Bikuben Savings Bank, Copenhagen showing use of Secomastic.

Secomastic Ltd., Western Road, Bracknell, Berks.

Checking Decay

Any proprietary treatment which sets out to preserve building material against the weather must contend with the fact that there is no substitute for the weather—particularly for the English weather with its insidious alternation of wet and frost—and that therefore no one can be sure of its durability until it has been on the market for ten or twenty years. Unfortunately, decaying buildings cannot always wait so long, and there are occasions, therefore, when the architect must be prepared to take a reasonable chance.

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Building by the South Bank

Near to Waterloo and adjacent to Westminster Bridge Road, this imposing office block is rapidly being completed by Richard Costain Limited. It will make a major contribution to the attractive new development now taking place in the Borough of Lambeth.

The architect is R. N. Wakelin, F.R.I.B.A. of Campbell Jones and Sons.

The structural design by E. J. Cook & Co. (Engineers) Ltd., calls for the use of Stahlton pre-stressed floor construction which will give a continuous flat soffit to the ceiling of this nine-storey building.

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Preservatives which have silicone as their main constituent have now been on test in this country for about three years and in America for about six; and there are indications that, by and large, they are probably the best bet. We understand that they are countenanced by the CPAB, by the Ancient Monuments branch of MOW—though not by other departments of MOW which, in matters of this kind, must always wait for the clearance of BRS. The opinion of BRS on this subject was last voiced in Digest 90 (July 1956) *Colourless waterproofing treatments for damp walls*, which gave a sober account of how silicone treatments behave, but which was careful to say nothing about how long they would last. The facts which seem well established are that they do not alter the appearance of the material they are applied to, they do not weaken it, they permit it to 'breathe,' and that during the first years at least they throw the water off in a spectacular way, so that it falls down the surface of the treated material in droplets—like the droplets of mercury. This latter phenomenon ceases in course of time, but the treatment persists below the treated surface and still remains an effective barrier to wet.

One range of silicone treatments of this kind is that marketed by Nubold Development Ltd., under the trade name 'Nubex.' The range includes specialized products for use with every conceivable material used out of doors, from masonry and brickwork to asbestos, timber and even canvas; and including also a bonding agent for consolidating crumbling masonry. The firm issues an excellent 'general survey' which gives all the information the architect will want to know. Nubex is applied with a spray gun (which costs £14 14s. 0d.) and the cost of the material in applying it to 'surfaces of average porosity' is given at between 1s. 6d. and 2s. per yd. super.

Nubold Development Ltd., The Mount, Crawley, Sussex.

Protective Coatings

Corrosion chemistry (sometimes called 'corrosion engineering') is a subject which passes rapidly beyond the architect's understanding. The products which it uses have been developed to cope with situations which he meets with rarely and which are altogether more exacting than those to which he is accustomed. Nevertheless, it *is* of interest to him when a new basic chemical product touches for the first time on the outer fringe of building technology. For most architects the first time they heard of 'Neoprene' (a polychlorobutadiene, or, if you like it better, a synthetic rubber) was in connection with gaskets for sealing curtain walls, or washers for fixing prefabricated plumbing units. We are here concerned with its use as a base for a corrosion-resistant paint. 'Neoprene' and 'Hypalon' (a sulphochlorinated polyethylene) are the trade names of two basic products developed by Du Pont de Nemours. They have been used in this particular application by Semtex Ltd., the floor people, and E. & F. Richardson Ltd., the specialist anti-corrosive paint manufacturers, to produce a range of protective coatings which are being marketed under the trade name 'Semprene Adcora.' The primary use for these coatings is for painting metal parts in laboratories and works where chemical attack is direct and very fierce. Nevertheless, there are certain classes of exposure which they are designed for which are of more general building application (e.g. the structural steel of buildings containing process equipment and surfaces in yard areas adjoining) and it may well be only a matter of time before it is considered economic to use materials in this class for milder exposures, such as for steel by the sea. Neoprene coatings are expensive: 'P6' of this range costs 70s. per gal., but gives a minimum thickness of 5 mils with one coat where lead paints would require three coats. As yet these coatings are black only, but it is hoped that some at least will soon be available in red, grey and aluminium.

E. & F. Richardson Ltd. Buckingham.

Bulldog Clips

Fixing gadgets lend themselves readily to good treatment in trade literature—but rarely get it. An exception is that pioneer fixing for timber-on-a-solid-floor, the Bulldog clip, which is admirably set forth in the Adamite Co. Ltd's new Bulletin No. 10. First used (we were interested to learn) in Carreras' Factory at Mornington Crescent in 1926, the Bulldog clip has been developing to meet changes in technique. It can be got, for instance, with a single leg for use with precast beam or pot floors, with a long shank for use in suspending a ceiling, and with pads for acoustic floors. The exact dimensions, uses and methods of fixing each variant are fully described in text and drawings and the Bulletin finishes with an account of an experiment carried out by the National Physical Laboratory to find out the value of the acoustic clip in stopping impact sound in a floor. In all, a useful presentation of a useful product.

The Adamite Co. Ltd., 94-98 *Petty France, London, S.W.1.*

Advertisements

London County Council. Central School of Arts and Crafts, September, 1957. 7/11 lbs part-time head of department, man or woman, for the department of Interior Design and Furniture. Should have knowledge of architecture, period furniture, furnishings, and be cognisant with modern design and materials. Burnham F.E. salary scales, Grade II, man 7/10ths of £1,400 to £1,600 (man); increments £24 10s. [illegible], 7/10ths of £1,240 to £1,600 (woman, including equal pay), both plus London Allowance. Application forms from Secretary at School, Southampton Row, W.C.1, to be returned by 18th May, 1957.

Buckinghamshire Education Committee. High Wycombe College of Further Education (Principal: W. J. Davies, J.P., B.Sc.). Lecturer in Advanced Furniture Design. Candidates must have had sound basic training together with suitable industrial experience. Architectural experience or ability to offer additional subjects such as Management, Work Study, etc., would be an advantage. Salary will be paid in accordance with the appropriate Burnham Report. Further details and forms of application may be obtained from the Principal, Queen Alexandra Road, High Wycombe, to whom they should be returned as soon as possible.

Architectural Assistants may be required for interesting work in London from early June with opportunities for overseas later. Luncheon vouchers, 5-day week, pension scheme. Applications, giving full particulars of experience and salary required, to Box 5902.

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